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PROJECT PROFILES ON RESERVED ITEMS
VOLUME II

PROJECT PROFILES

ON

RESERVED ITEMS

VOLUME II

(200 SCHEMES)



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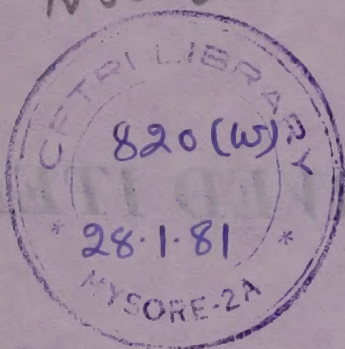
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FOREWORD

Development of small-scale and cottage industries occupies a pride of place in the programmes for the economic growth of the rural and semi-urban areas. One of the major groups of industrial possibilities are the items reserved for the small-scale sector. It was, therefore, felt that special attention should be paid to draw-up project profiles in respect of these items.

2. In the past such profiles were prepared on an ad-hoc basis by many of the Small Industries Service Institutes but they have since become outdated and the information provided in them has become obsolete. A special effort had, therefore, to be made not only to update the existing profiles but also to prepare fresh profiles for a very large number of new items reserved in December, 1977. As a result of this effort the Small Industries Development Organisation published, in the second half of 1979, three massive volumes of Project Profiles covering 807 reserved items. It was indeed heartening and indicative of the popularity of the publication that all the three volumes were sold out in a few months' time, and still there was a huge unsatisfied demand. To meet this demand from the District Industries Centres, State Directorates of Industries and Small Industries Corporations, Financial Institutions and other organisations engaged in the promotion of small scale industries as also from individual entrepreneurs, we have now brought out the second edition of the three volumes of these Project Profiles.

3. Great care has been taken to ensure that the information provided in the profiles is accurate and upto-date. Admittedly, there will be variations in respect of wages and other local considerations from region to region but, by and large, the Profiles will provide to potential entrepreneurs basic idea of the production process, the investment involved as well as the type of profitability that can be expected. In respect of some of these items, the Small Industries Development Organisation is also getting ready feasibility reports which could be used to obtain financial assistance from the banks.

4. These Project Profiles represent the cumulative experience of the technical personnel working in the Small Industries Development Organisation. They will feel amply rewarded if the Project Profiles could be of assistance to the promotional organisations and to many young entrepreneurs throughout the country. Any suggestions for improving these profiles or for correcting any mistakes that might have crept into them would be most welcome.

New Delhi-11,

June 10, 1980.

RAM K. VEPA,

Development Commissioner,
Small Scale Industries,

MECHANICAL & METALLURGICAL INDUSTRIES

I. Product & its uses

The use of Aluminium Furniture has gone very much ahead due to the expansion of civilisation and modern outlook of living. The reason of increasing popularity is because of its elegant show, lightens in weight and cost factor in comparison to conventional furniture.

II. Market Potential

The market potentiality of Al. furniture is increasing day by day because of its various design and utility to cater the need of everybody. Apart from the household use, these furniture are being used in Railway, Defence & big offices. To keep pace with the interior decoration of the offices the use of Al. furniture has become indispensable.

Generally, the furniture are sold through some show room or distributor.

III. Production Target.

It is proposed to manufacture 60 nos. Al. Folding chair, 30 nos. Al. Easy chairs, 50 nos. Al. Side table per month initially.

IV. Product details & process of manufacture.

First, as per the design the bills of material has to be selected. According to the layout the Al. pipe or section is to be cut in the abresive cut off machine and then the cut out pipe is to be bend in the Bending machine. The bend pipe is then assembled with plastic tape, timber or glass top, as the case may be. In some cases the section are to be anodised which may be done from outside source.

V. Inspection & Quality Control

No rigid inspection is called for the products during processing. However care should be taken to check defective raw materials during purchase. A visual check is also necessary during process to avoid deformation etc.

VI. Land & Building

Workshop including office—
Covered area—600 sft. Rented 300/-

VII. Plant & machinery

1 Abresive cut off machine with
1/2 H.P motor & starter 1 No. 3,500/-

2. Hydraulic hand operated pipe bending machine with different dies	1 No.	3,500/-
3. 1/2" capacity Bench drill with 1/2 H. P. motor	1 No.	1,300/-
4. Portable buffing & Polishing with 1/2 H. P. motor	1 No.	950/-
5. Fixtures	L.S.	1,000/-
6. Hand tools measuring instrument etc.	L.S.	1,500/-
Freight, S. T. installation electrification	L.S.	2,250/-
Furniture & office requisite		4,000/-
		<u>18,000/-</u>

VIII. Raw Material (per month)

1. 3/4" × 16 gauge Al. pipe @2.50 per rft.	1500 rft.	3,750/-
2. 1" square Al. Section @ 3.50 per rft.	500 rft	1,750/-
3. Decorative sections @4.00 per rft.	250 rft.	1,000/-
4. Timber foam plastic tape, glass, screws, rubber shoes etc.	L.S.	1,000/-
	Rs.	<u>6,500/-</u>

IX Staff / Labour (per month)

1. Supervisor	1 no.	400/-
2. Clerk-cum-Accountant	1 no.	300/-
3. peon	1 no.	150/-
4. Skilled worker	4 nos.	1,200/-
5. Unskilled worker	3 nos.	450/-
6. Watchman	1 no.	150/-
7. Cost of labour benefit 10%		<u>2,650/-</u>
		265/-

2,915/-

Say—Rs.

3,000/-

X. Other expenditure (per month)

1. Rent	300/-
2. Electricity	100/-
3. Consumable tools oil lubricant & other consumable stores	50/-
4. Cartage & freight	100/-
5. Packing cost	50/-
6. Publicity	100/-
7. Sales, expenses including travelling	200/-
8. Stationery, postage, Insurance & other misc. expenditure	200/-
Rs.	1,100/-

XI. Working capital required (per month)

1. Raw material	7,500/-
2. Staff & labour	3,000/-
3. Other expenditure	1,100/-
Rs.	11,600/-

XII. Total Capital Investment

1. Machinery & equipment	18,000/-
2. Working capital for 3 months	34,800/-
Rs.	52,800/-

XIII. Cost of production (per annum)

1. Raw material	90,000/-
2. Staff & labour	36,000/-
3. Other expenses	13,200/-
4. Interest on Capital @15%	8,400/-
5. Depreciation on machines @19%	2,160/-
Rs.	1,49,760
Say Rs.	1,50,000

XIV. Total sale (per annum) By sale of

(1) 720 nos. Al. Folding chair with rexine top @100/- each	72,000/-
(2) 360 nos. Al. Easy Chair with plastic tape @125/- each	45,000/-
(3) 600 nos. side table with glass top @80/- each	48,000/-
Rs.	1,65,000/-

XV. Profitability

Total sale Cost of production profit

Rs. 1,65,000—1,50,000/- = 15,000/-

(a) Percentage of profit on sale—9% approx.

(b) Percentage of profit on Interest—3 %

XVI. Break Even Analysis

B. E. P.—Annual fixed cost × 100

Annual fixed cost + profit

Fixed cost (per annum)

(1) Rent	3,600/-
(2) Interest	8,400/-
(3) Deposit	2,162/-
(4) 40% on salaries	14,400/-
(5) 40% other expenses (excluding rent)	3,800/-
Rs.	32,360/-

Therefore—

B.E.P. = $\frac{32,360 \times 100}{50,140} = 65\% \text{ app.}$

XVII. Name and address of machine Supplier

- (1) M/s Power Tools & Appliances Co. 2.
B. B. D. Bag East Cal-700001.
 - (2) M/s Turner & Tools 15. Ganesh Ch.
Avenue. Cal;-13.
 - (3) M/s Kala Machines Tools No.113, Shivaji
Nagar, Bangalore
- (Reserved item Sl. No. 396)

I. Product and its uses

This scheme is envisaged for the manufacture of ornamental fittings such as Emblem, Monograms, Metallic bands and Automobile fittings used in Automobile Vehicles.

These items do not form any main automobile components and only serve as fancy decorative fittings. Amongst the vehicle users, it is now a fancy to use such types of fittings to add grace and provide attractive look to the vehicle.

II. Production Target

The scheme provides for a production capacity of 7.5 tons P.M. of approximate values of ornamental fittings, of metallic cast and engraved on metallic plates items. Apart from this manufacturing items, the unit can also take up multiproduct mix items such as roof camp assembly.

- (a) Production capacity/per annum 90 Tons
(b) Value Rs. 6,30,000/-

III. Production details & process of manufacture

These items are mostly made from Brass castings and aluminium castings. Sometimes these are electroplated on the brass strips by bright chromium plating. Some of the designs are also engraved as cast plates as well as from rolled plates.

IV. Quality control and standards

There are no standards for these items and have to be made according to attractive drawings and designs, which would appeal the buyers. The emblems are required by automobile manufacturers to fix up. The Brand Monograms are supplied to them and also in the motor market.

V. Land and Buildings

Rented Rs. 800/-

Built up area—approximately 1000 sq. metres.

VI. Machinery and Equipment

- (1) Pit Furnace suitable for melting 30 tons metal complete with electric motor & blower 2 Nos, Rs. 4,000.00

- (2) Scrapping Add a suitable for scrapping articles Max. size 16" x dia x 5" deep. 3 Nos. Rs. 3,000.00
(3) Moulding boxes assorted sizes LS 1,000.00
(4) Moulding Tools Furnaces Equipment LS 500.00
(5) Double ended grinder . . . 1 No. 1,000.00
(6) Pickling and cleaning tank . . . 2000 500.00
(7) Two Dimentional pentograph Eng- raving Machine Tool Craft Model 1000 4,500.00
(8) 10 tons power Press . . . 1 No. 6,000.00
(9) Hans Press No. 5 . 1 No. 1,500.00
(10) Injection moulding machine hand operated 202 capacity . . . 1 No. 2,000.00

Rs. 24,000.00

- (ii) Electrification & Installatgon Charges Rs. 2,400.00

Total cost of Machinery & Equipment 26,400.00

- (iii) Cost of Moulds/ other moulds 2,000.00

- (iv) Cost of office equipment 1,000.00

- (v) Pre-operative expenses 2,000.00

Total fixed cost; 31,400.00

VII. Raw Materials (Per Month)

- (1) Aluminium Ingot scrap and Brass scrap . . . 40,000.00
(2) Hard coke @ Rs. 300.00 per ton—2 tons . . . 600.00
(3) Crucibles . . . 300.00
(4) Flex binders etc. . . 25.00
(5) Moulding sand . . . 50.00
(6) Fire wood, cotton waste etc. . . 25.00

(7) BP Sheet 22 SWG— 1/2 Ton	Rs. 2,000·00
(8) Polyster granules— 100 Kg. @ Rs. 12/- per kg.	1,200·00
Total cost of raw materials/ per month	43,900·00

VIII. Staff & Labour (Per Month) :

	Rs.
(1) Manager/ Supervisor . . . 1 No.	400·00
(2) Skilled workers . . . 2 Nos.	400·00
(3) Skilled workers . . . 1 No.	150·00
(4) Unskilled workers . . . 1 No.	120·00
Clerk/typ. . . 1 No.	250·00
(6) Peon/Watchman . . . 1 N.	200·00
	<u>1,520·00</u>

IX. Other expenses :

	Rs.
(1) Power 25 HP . . .	300·00
(2) Water 20,000 litres . . .	30·00
(3) Rent . . .	600·00
(4) Postage & Station- ery . . .	50·00
(5) Consumable Stores . . .	50·00
(6) Repairs and main- tenance . . .	50·00
(7) Transport charges . . .	200·00
(8) Insurance . . .	20·00
(9) Sub-contract expend- es for electroplating . . .	300·00
	<u>1,600·00</u>

X. Working Capital (Per Month) :

	Rs.
(1) Staff & labour . . .	1,520·00
(2) Raw Materials . . .	43,900·00
(3) Other contingent expenses . . .	1,600·00
	<u>47,020·00</u>
Say	47,000·00
For three months : Rs.	47,000 × 3
= Rs.	1,41,000·00

XI. Total Capital Investment :

	Rs.
(1) Fixed capital . . .	31,400·00
(2) Working capital/3 months . . .	1,41,000·00
	<u>1,72,400·00</u>

XII. Production Cost (Per Year) :

	Rs.
(1) Working capital . . .	5,64,000·00
(2) Depreciation on machinery . . .	3,140·00
(3) Interest on capital investment @ 15 % p.a. . .	25,360·00
Total Production Cost	<u>5,92,500·00</u>

XIII. Sales Proceeds :

	Rs
(i) By sale of 90 tons of castings and emblem plates @ Rs. 7000/- per tonne	6,30,000·00
(ii) By sale of plastic moulded items . . .	30,000·00
	<u>6,60,000·00</u>

XIV. Profitability :

Sales—Cost of production = Profit
6,60,000—5,92,500 = Rs. 67,500/-p.a.

Percentage of profit
over sales $= \frac{67,500 \times 100}{6,60,000} = 10\%$

Return on Investment $= \frac{67,500 \times 100}{1,72,400} = 38\%$

XV. Break Even Analyses :

B.E.P. $= \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Sales} - \text{Annual Variable Cost}} = 42\%$

XVI. Names and addresses of machinery and equipment suppliers :

- (1) M/s Botliboi Pvt. Ltd., J.C. Road, Bangalore-2.
- (2) M/s Indian Furnace Co. Ltd., Lotus Cinema Building, 12-A, Dr. Annie Basant Road, Bombay-18.
- (3) M/s Ashok Manufacturing Co. (P) Ltd., 37, Panchkuian Road, New Delhi-1
- (4) M/s Singal Engineering Works, Station Road, Aligarh.

XVII. Addresses of Raw Materials suppliers :

- (1) M/s. Hindustan Steels, Unity Building Bangalore-2.
- (2) M/s. Calico Chemicals & Plastics, KG Road, Bangalore-9.

(Reserved item Sl. No. 635)

I. Product and its use

Auto Lamps are one of the most important items in the vehicle. No vehicles are manufactured without the auto lamps. These lamps are used for spot lighting and stopping signal.

II. Market potential

Auto lamps require replacement when it is absolutely unserviceable since no risk can be taken as it may involve risk of human life during driving the automobiles. Every year the production of automobiles are increasing and as such the auto lamps are also being used in each vehicle. So there is a good market for this item.

III. Production Target. .

It is proposed to manufacture 3500 pcs. of side lamp per month. For the purpose of calculation the lamps for Ambassador car has been taken into consideration. The shape, size and design changes according to the type of vehicle.

IV. Product details and process of manufacture

The entire Auto lamp assembly consists of the various components viz., Reflection, metal ring rivetted with holder, rubber connector, transparent plastic cover, wire terminals, Bakelite spacers, springs, screw & nut. Reflector and metal ring is a sheet metal component and is processed by pressing operation in press machine followed by metal treatment for perfect illumination. Other parts like rubber, bakelite & plastic cover are bought out components which are assembled with galvanised screw & washer. Each lamp assembly first packed with polythene packet and then in the printed Card Board Box.

V. Inspection and Quality control

Auto lamps are generally manufactured with the drawings and design of parent vehicle industry. Care should be taken in all steps for its interchangeability. Plating takes a vital role for the better reflection. So it is advisable to get the plated components tested from recognised test houses.

VI. Land & Building

Covered area 60 sq.
metre Rented 150.00 p. m.

VII. Machinery & Equipment. . .

		Rs.
(1) Geared hand lever shearing m/c. cap. 16 SWG.	1 No.	950.00
(2) 30 ton power press with 5 H.P. motor & accessories	1 No.	12,500.00
(3) Double Arm ball press No. 12	1 No.	2,500.00
(4) Bench Drill with 1/2 H.P. Motor	1 No.	850.00
(5) Tapping machine with 1/2 H.P. motor	1 No.	3,400.00
(6) Die & punches	L.S.	4,000.00
(7) Hand tools, measuring instrument	L.S.	2,000.00
		26,200.00
(8) Installation & electrification	L.S.	2,800.00
(9) Furniture & fixture including office equipment		2,000.00
		31000.00

VIII. Raw materials per month :

(1) C.R.C. sheet 20 gauge & 22 gauge	700 Kgs.	3,500.00
(2) Rubber connector (bought out item)	3500 Nos.	700.00
(3) Plastic cover (bought out item)	3500 Nos.	1,050.00
(4) Wire, galvanised screws & nuts, Bakelite, springs etc.	L.S.	500.00
		5,750.00

X Staff & Labour per month:			Rs.
(1) Manager	1 No.	600	00
(2) Supervisor	1 No.	400	00
(3) Skilled operator	2 Nos.	600	00
(4) Unskilled labour	3 Nos.	600	00
(5) Watchman-cum-peon;	1 No.	200	00
		2400	00
Cost of labour benefit @10%		240	00
		2640	00

Other expenses per month :

(1) Rent	150	00
(2) Electricity	200	00
(3) Consumable tools, oil, lubricants & other consumable tools	100	00
(4) Galvanising & plating charges	1,000	00
(5) Carriage & freight	100	00
(6) Packing cost	300	00
(7) Publicity	50	00
(8) Sales expenses including travelling	100	00
(9) Stationery & other machine expenses	100	00
	2,300	00

I. Working capital required (Per month)

(1) Raw material	5,750	00
(2) Staff & Labour	2,640	00
(3) Other expenses	2,300	00
	10,690	00

II. Total Capital Investment :

(1) Machinery & equipment	31,000	00
(2) Working capital for 3 months	32,070	00
	63,070	00
Say—Rs.	63,000	00

III. Cost of Production (Per annum)

(1) Raw material	69,000	00
(2) Staff & labour	31,680	00
(3) Other expenses	27,600	00
(4) Interest on capital @ 15%	9,450	00
(5) Depreciation on m/c. @ 10 %	3,100	00
	1,40,830	00

XIV. Total Sale (Per annum)*		Rs.
By sale of 42,000 nos. side lamp		
3.60 each		1,51,200
By sale of recoverable scrap		6,900
		1,58,100

XV. Profitability :

Total Sale	Cost of production	Profit.
Rs. 1,58,100	1,40,730	17,370

$$(a) \text{ Percentage of profit} = \frac{17,370 \times 100}{1,58,100} = 7.8\%$$

$$(b) \text{ Percentage of profit on investment} = \frac{17,370 \times 100}{63,000} = 28\%$$

XVI. Break Even Analysis :

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{profit}}$$

Fixed cost (Per annum)

(1) Rent	1,800	00
(2) Interest	9,450	00
(3) Depreciation on m/cs. & equipment	3,100	00
(4) 40 % salary	12,800	00
(5) 40 % other expenses (excluding rent)	11,320	00
	38,470	00

$$\text{B.E.P.} = \frac{38,470 \times 100}{55,840} = 62\%$$

XVII. Names & addresses of machinery suppliers :

- (1) M/s. Power Tools & Appliances Co.
123, Mount Row, Madras-6.
- (2) M/s. Atlas Works (P) Ltd.,
119, Rippon St., Calcutta-16.
- (3) M/s. Kala Machine Tools,
119, Shivaji Nagar,
Bangalore-57.

(Reserved item Sl. No. 643)

I. Product and its uses

The radiators are used in water cooled petrol and diesel engines and they keep water circulation in the Cylinder heads of engines at relatively constant temperature and thus prevent the overheating of engine. The designs of radiators vary according to the types of vehicles and different manufacturers of automobiles. Radiators are also used in stationary types of engines. The core of the radiator is made of brass or copper sheets and tubes. The bottom and top shells are made out of brass sheets. The items has been reserved for manufacture exclusively in the small scale sector.

II. Market Potential

After a short period of slump in the automobile industry, the prospects are again brightening up. The new units set up in this line will be able to supply to both original equipment manufacturers and in the spare parts market. For local consumption the small scale units may cater to local spare parts market capably.

III. Production Targets

In this profile manufacture and sale of 1000 nos. of Radiator Cores have been planned. Estimates have been prepared on the basis of equal proportion of car and truck radiators.

IV. Production details and process of manufacture

The brass tubes are required to be tinned. For this, prior to forming, the sheets are tinned in Automatic Strip Tinner. The Fins are punched and embossed out of Copper Strips in Press Machine. Then the tubes and fins are assembled in Assembly Jigs. Then the assembled cores are fluxed in Fluxing & Draining equipment. The cores are then baked and squared in Jig to take care of any deformation. The Header Plates are pressed in machine and side bends are made by Hand Rolling machines. Then the Header Plates are hot dipper in Solder bath and Assembled with Core. Prior to assembly the cores should be tested for pressure testing. For the thin sheets required for the industry copper, Zinc, Tin and lead ingots will have to be imported and sheets etc. may be got rolled in large manufacturing units.

V. Quality Control and Standard

Indian Standard Specification for Radiator Core Copper Foil and Brass Strip is IS: 3331-1965. The

purchase and procurement of raw material strictly according to this specification is essential for the maintenance of standard quality. There should be vigilant quality checking in tinning and soldering operations which will also be helpful in keeping down the cost of operations as the solders and tin are very costly materials.

VI. Land and building

Covered area of 300 sq. metres	Rs.
to be rented @ Rs. 5/-per square	
metre per month	1,500·00
	per month

VII. Machinery and equipment

(1) Automatic Tube Drawing M/c.	60,000·00
(2) Automatic Strip Tinner	25,000·00
(3) Automatic Fin Roller M/c.	25,000·00
(4) Heavy Duty Core Assembly Jigs—4 nos.	16,000·00
(5) Special Soldering Oven	30,000·00
(6) Header Plate Dipping Equipment	12,000·00
(7) Fluxing & Draining Equipment	10,000·00
(8) Guillotine Shearing M/c. (Treadle 48" capacity)	5,500·00
(9) 3/4" Capacity Drill M/c.	3,000·00
(10) Double ended Pedestal Grinder	1,500·00
(11) Ball Press—2 nos.	2,000·00
(12) Compressor for 100 P.S.I.	4,000·00
(13) Squaring Jig	4,000·00
(14) Dies, Tools, Fixtures, Gadgets	20,000·00
(15) Installation, electrification	12,000·00
(16) Furnitures, Office equipment	5,000·00

Rs. 2,35,000·00

VIII. Salaries and Wages (Per month)

	Rs.
(1) Engineer cum Manager	1,200·00
(2) Chargehand	600·00
(3) Clerk cum Accountant	500·00
(4) Skilled workers—3 nos.	1,200·00
(5) Semi Skilled Workers— 4 nos.	1,000·00
(6) Unskilled workers—2 nos.	400·00
(7) Watchman Cum Peon— 2 no.	400·00
(8) Labour Amenities	700·00
	6,000·00

IX. Raw Materials (Per month)

	Rs.
(1) Copper Ingots 5200 kg @Rs. 26 per kg.	1,35,200·00
(2) Zinc Ingots 1420 kg. @Rs. 11 per kg.	15,620·00
(3) Tin Ingots 400 kg. @ Rs. 170 per kg.	68,000·00
(4) Lead Ingots 590 kg. @ Rs. 11 per kg.	6,490·00
(5) Cost of Conversion of the Ingots into Sheets @ Rs. 10/- for 6000 kgs. of Ingots	60,000·00
(6) Chemicals, Flux etc.	10,000·00
	2,95,300·00
Say	
	2,95,300·00

X. Other Expenses (Per month)

	Rs.
(1) Rent	1,500·00
(2) Power etc.	250·00
(3) Maintenance, replacement of small tools	400·00
(4) Consumable stores	200·00
(5) Contingencies	150·00
(6) Packing, Transport	500·00
	3,000·00

XI. Working Capital (3 Months' Recurring Expenses)

	Rs.
(1) Salaries and Wages	18,000·00
(2) Raw Materials	8,85,900·00
(3) Other Expenses	9,000·00
	9,12,900·00

XII. Capital Investment

	Rs.
(1) Fixed	2,35,000·00
(2) Working	9,12,900·00
	11,47,900·00
Say	
	11,48,000·00

XIII. Cost of Production (Annual)

	Rs.
(1) Salaries and Wages	72,000·00
(2) Raw Materials	35,43,600·00
(3) Other Expenses	36,000·00
(4) Depreciation of machinery @ 10% per annum	23,500·00
(5) Interest on Capital Invest- ment @ 15% per annum	1,72,200·00
	38,47,300·00

XIV. Sales Proceeds (Annual)

	Rs.
(1) By sales of 6000 nos. of Truck Radiators @ Rs. 500 each	30,00,000·00
(2) By sales of 6000 nos. of Car Radiators @ Rs. 280 each	16,80,000·00
	46,80,000·00

XV. Profitability (Before Taxes)

Profit — XIV — XIII = Rs. (46,80,000
38,47,300) = Rs. 8,32,700

The profit is 17% of sale and 72% of
Capital Investment.

XVI. Break Even Analysis**A. Fixed Cost**

	Rs.
(1) Depreciation of machinery	23,500·00
(2) Interest on Capital Invest- ment	1,72,200·00
(3) Rent	18,000·00
(4) 40% of Salaries & Wages	28,800·00
(5) 40% of other Expenses	14,400·00
	2,56,900·00

$$\begin{aligned}
 &\text{Net Fixed Cost} \quad . \quad . \quad . \quad 2,57,000 \cdot 00 \\
 &\text{Break Even Point} = \\
 &\quad \text{Net Fixed Cost} \times 100 \\
 &\quad \text{Fixed Cost} + \text{Profit} \\
 &\quad 257000 \times 100 \\
 &= \frac{257000 + 832700}{257000000} \\
 &= 1089700 \\
 &= 35\% \text{ nearly.}
 \end{aligned}$$

XVII. Sources of Raw Material & Machines

The non-ferrous ingots mentioned in the Profile may be imported on actual users licence through the Minerals & Metals Corporation of India. For conversion into sheets, the following concerns are to be approached:

1. Kamani Metal & Alloy Ltd., Kamani Chambers, Nicoll Road, Ballard Estate, Bombay-400 001.

2. Devidayal Rolling & Refineries (P) Ltd., Gupta Mills Estate, Reay Road, Bombay-400 010.

As regards machinery there is no regular manufacturer in the country. Some of the manufacturers, however, got their plants copied by experienced machine manufacturers on job order basis. One such manufacturer is:

M/s. Meghraj Machines,
2/9 Industrial Estate, Gorwa Road,
Baroda-390 003.

For general purpose machines, following dealers may be approached:

- (1) International Machine Tools Corporation, 5 Bank Street, P.O. Box 799, Fort, Bombay-400 001.
- (2) Power Tools & Appliances Co., 2, Dalhouse Square East, Calcutta-700 001.

(Reserved item Sl. No. 637)

I. Product and its uses

Every one knows cycle carriers and it does not require any description. The cycle carrier is made of channels or sheets and spring wires and is fitted over the back wheel of any cycle. It is used for carrying any luggage which the cyclist wishes to carry. The cycle carriers are mostly made now-a-days, with steel channels bent in the shape of carrier and fixed with springs so that the articles are positioned securely. This profile is prepared for manufacture of cycle carriers of channel type.

II. Market Potential

The cycle carrier is a must for every cycle. Hardly there may be any cycle without a carrier. Further the cycle is the common man's vehicle and the demand for cycle is very large. The demand for cycles also goes up every year. As carrier is an accessory for the cycle its demand also is large. The cycle manufacturers do not supply the carriers as original equipment and hence these are sold separately as an accessory through cycle dealers. The carriers are to be marketed through cycle and cycle spares dealers only. The replacement market is very less.

III. Production Target

It is proposed to manufacture 125 dozens of cycle carriers per month.

IV. Production details and process of manufacture

The steel channel sections are taken and cut to length. Then they are bent to shape by means of fixtures. Springs are purchased from outside market. The different components are assembled and painted and backed in a locally fabricated Baking Chamber. Then they are sent for Marketing.

V. Inspection & Quality Control

The carriers should have a good finish and the painting should not peel off after sometime.

VI. Land & Building

Covered Area 100 sq metres Rented Rs. 500.00

VII. Machinery & Equipment

	Rs.
(1) Universal hand shearing machine 1 No.	800.00
(2) Fly Press No. 3 1 No.	800.00
(3) D. E. Bench Grinder 10" dia wheel 1 No.	1,200.00
(4) Bending fixtures tools equipment etc.	3,500.00
(5) Baking oven (stoving chamber)	2,500.00
(6) Office furniture and equipment	2,000.00
(7) Installation and electrification	1,200.00
Total	12,000.00

VIII. Raw material (per month)

	Rs.
(1) Mild steel channels 2.5 tons	7,500.00
(2) Purchase parts like bolts, Nuts, spring etc.	700.00
Total	8,200.00

IX. Staff and Labour (per month)

	Rs.
(1) Skilled worker 1 No.	400.00
(2) Semi skilled workers 2 No.	570.00
(3) Unskilled workers 2 Nos.	400.00
(4) Office Staff 2 Nos.	570.00
(5) Welfare facilities for staff & labour	200.00
Total	2,000.00

X. Other expenses (per Month)

	Rs.
(1) Rent	500.00
(2) Electricity and water	50.00

(3) Consumable tools . . .	100.00
(4) Oils, lubricants and other consumable stores . . .	200.00
(5) Cartage and Freight . . .	50.00
(6) Maintenance . . .	100.00
(7) Replacement of dies . . .	50.00
(8) Packing cost . . .	300.00
(9) Sales expenses including travelling . . .	150.00
(10) Stationery, postage and misc . . .	100.00
Total	1,600.00

XI. Working Capital (per Month)

	Rs,
(1) Raw Materials . . .	8,200.00
(2) Staff & Labour . . .	2,000.00
(3) Other Expenses . . .	1,600.00
Total	11,800.00

XII. Total Capital Investment

	Rs.
(1) Machinery & equipment	12,000.00
(2) Working capital for three months . . .	35,400.00
Total	47,400.00

XIII. Manufacturing Cost (Per Month)

	Rs.
(1) Raw Material . . .	8,200.00
(2) Staff & Labour . . .	2,000.00
(3) Other expenses . . .	1,600.00
(4) Depreciation on machinery & equipment @ 10% per annum . . .	100.00
(5) Interest on capital investment @ 15% p.a. . .	595.00
Total	12,495.00
Say	12,500.00

XIV. Total Sales (per)Month)

By sale of 125 Dozens of cycle carrier Rs. 110/- per doz. Rs. . . . 13,750.00

XV. Total Profit (Pre Month)

Profit
= Total sales—Manufacturing cost
= 13,750—12,500.
= 1,250/-per month.

(a) Percentage of profit on sales ;

Profit per month
—————X100
Sales per month

1250
= —————X100
13750
= 9.0%

(b) Percentage of profit on Investment

Profit per annum
—————X100
Capital Investment

1250X12
= —————X100
47400

15000
= —————X100
47400
= 31.7% Approximately.

XVI. Break Even Analysis

Break even point = $\frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}}$

Fixed cost per month	
(1) Rent	500.00
(2) 40 of staff & labour	800.00
(3) 40% of other charges excluding rent	440.00
(4) Depreciation on machines	100.00
(5) Interest on capital investment	625.00
Total	2,465.00

Annual fixed cost
= Fixed cost per monthX12
= 2465X12
= Rs. 29580.00

Break Even Percentage

Annual fixed cost
= —————X100
Annual fixed cost — Annual profit
29580
= —————X100
29580 + 15000
= 66%

XVII. Name and Addresses of suppliers of Machinery & equipment

- (1) M/s. International Machine Tool Corporation, 5, Bank Street, Behind State Bank, Fort, Bombay-400023.
- (2) M/s. Maneklal & Sons, 115/116, Narayan Dharu Street, Bombay.
- (3) M/s. Machine Tools Traders (Calcutta) 25, Ganesh Chandra Avenue, Calcutta—700013.

XVIII. Name and Addresses of suppliers of raw materials

- (1) Any nearest branch of Steel Authority of India.
- (2) M/s. Mehta Manmal Chenmalji & Co., 87-88, Kika Street, Bombay—400004.

(Reserved item Sl. No. 692)

I. Product & its uses

Cotter Pin is a taper wedge, used to fasten the bicycle crank with bottom bracket axle. It consists of three parts viz. washer, nut and a taper wedge or cotter pin. With the increase in demand of bicycles, a number of units have come up for the manufacture of this item also. The demand is ever growing due to increase in population and purchasing power of the people. The product has very good scope as original equipment for bicycle manufacturers as well as spare parts market.

II. Production Targets

It is proposed to manufacture 750 gross cotter pins per month.

III. Production details & Process of Manufacture

It is made out of Mild Steel drawn bars. The process of manufacture of different Cotter Pins components is as given below:

- (a) Cotter Pins Bar drawing—Straightening & Cutting to required length, facing one side turning second side—Milling—Thread Rolling.
- (b) Hex. Nut Bar Drawing—Straightening—Drilling & parting off—Tapping.
- (c) Washers These are to be purchased from out side.

Finally all the components are nickel plated.

IV. Inspection & Quality Control.

I.S.I. has prepared the specifications for the item. IS 1282-1958 may be referred for quality control. The main technical requirements are the proper diameter of the pin and the required size on the cotter pin and nut. These can easily be controlled by using the micrometers and the thread plug and ring gauges. The other requirement is the proper plating thickness and the surface finish.

V. Land and Building

Open Area = 200 sq. metre
Covered Area = 100 sq. metre
Rented Rs. 500 P.M.

VI. Machinery & Equipment

		Rs.
(1) Bar straightening & Cutting machine cap. 10 mm with H.P. electric and starter	1 No.	10,000.00
(2) Lathe Adda 600 mm bed length with 1. H. P. electric motor and starter	3 Nos.	9,000.00
(3) Thread Rolling Machine 10 mm cap. with 3 H. P. electric motor and starter.	1 No.	7,000.00
(4) Milling Machine Adda special purpose with 1 H. P. Motor and starter.	1 No.	4,000.00
(5) Automatic Nut cutting Machine 10mm cap. with 2 H. P. electric motor & starter	2 Nos.	12,000.00
(6) Nut tapping machine Automatic 10mm cap. with 1 H. P. Motor & starter	1 No.	4,000.00
(7) Double Ended Grinder 200 mm	1 No.	1,500.00
(8) Cotter Pin assembling Machine with 1/2 H.P. Motor & Starter (Auto runner)	1 No.	2000.00
(9) Tools, Jigs & Fixtures etc.		2,000.00
(10) Office Furniture & Equipment		2,000.00
(11) Electrification & Installation charges L. S.		5,000.00
Total		58,500.00

VI. Raw Material Requirement per month

	Rs.
(1) M. S. Black Bars 10 mm dia. and 12 mm dia. 4.25 M. T. @Rs 2800 per M. T.	11,900.00
Total	<u>11,900.00</u>

VIII. staff and Labour (per month)

(1) Foreman 1 No.	500.00
(2) Skilled workers 4 Nos.	1,200.00
(3) Semi skilled workers 6 Nos.	1,500.00
(4) Helper 1 No.	200.00
(5) Accountant/clerk 1 No.	350.00
(6) Chowkidar 1 No.	200.00
(7) Sweeper (Part time) 1 No..	50.00
Total	<u>4,000.00</u>

IX. Other Expenses (per month)

	Rs.
(1) Electricity & water	375.00
(2) Consumable tools	325.00
(3) Oils & Lubricants	100.00
(4) Postage & Stationery	50.00
(5) Travelling, freight & other expenses	150.00
(6) Rent	500.00
(7) Bar drawing charges	650.00
(8) Other unforeseen expenses	100.00
(9) Packaging Exp.	200.00
Total	<u>2,450.00</u>
Say	<u>2,500.00</u>

X. working Capital required for (3 month)

	Rs.
(1) Raw Materials 12700 × 3	38,100.00
(2) Salaries & Wages 4000 × 3	12,000.00
(3) Other Exp. 2500 × 3	7,500.00
Total	<u>57,600.00</u>

XI. Total Capital Investment

(1) Total Fixed Investment on Machinery & Equipment	58,500. 0
(2) Working capital for three months	57600.00
Total	<u>1,16,100.00</u>

XII. Cost of Production (per annum)

(1) Recurring Expenses 57600 × 42	30,400.00
(2) Interest on capital @15%	17,500.00
(3) Depreciation on Machinery & equipment @10%	5,800.00
(4) Sales Expenses	4,600.07
Total	<u>2,58,300.00</u>

Say 2,58,500.00

XIII. Sales Proceeds (per annum)

(1) By sale of 8900 gross cotter Pins @Rs. 33/-per gross	2,93,700.00
(2) By sale of scrap 18 Tons @Rs. 1000/-	18,000.00
Total	<u>3,11,700.00</u>

Say 3,11,500.00

XIV. Profitability (per annum)

$$\text{Profit} = \text{Total Sales} - \text{Cost of production}$$

$$3,11,500 - 2,58,500 = 53,000$$

(a) Percentage of profit sales

$$\frac{53000 \times 100}{3,11,500} = 17\%$$

(b) Percentage of return on investment

$$\frac{53,000 \times 100}{1,16,100} = 45.6\%$$

V. Break Even Analyses

$$\text{B.E.} = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Fixed Cost plus profit}}$$

Fixed Cost (Per annum)	Rs.
(1) Rent	6,000.00
(2) Interest on capital . . .	17,500.00
(3) Depreciation	5,800.00
(4) 40 % of salaries	19,200.00
(5) 40 % of other expenses .	12,000.00
	60,500.00

$$\text{B.E.P.} = \frac{60,500 \times 100}{60,100 + 53,000} = \frac{60,500 \times 100}{11,3500} = 53\% \text{ approx.}$$

XVI. Names and addresses of suppliers of Machinery & equipment

- (1) M/s G. A. Engineers Janta Nagar, Bhagwan Chowk Industrial Area B, Ludhiana.
- (2) M/s Jaimalech Works, Janta Nagar, Jaimal Road, Industrial Area, "B" Ludhiana.
- (3) M/s. Chhajju Singh & Sons Industrial Area, "B" Ludhiana.
- (4) M/s Millhard & Co. (Pvt., Ltd.) Micler Ganj, G. T. Road Ludhiana

(Reserved item Sl. No. 698)

I. Products and their uses

The products hardly need any introduction as they are quite common amongst bicycle users. Hub cones are fitted on front and gear axles of bicycle hubs whereas pedal cones are fitted on R.H. Side & L.H. side pedal axles. These cones act as bearings for smooth running of bicycle & pedals respectively. Both the cones need replacement after a year or two, as such these are in very good demand as spare parts as well as original parts.

II. Production Targets

It is proposed to manufacture 1000 gross Hubs Cones & 1000 gross pedal cones per month.

III. Production details and process of Manufacture

These cones are manufactured out of M.S. Drawn & straightened bars, (bright bars). The operations involved in manufacture are, facing, drilling, forming, parting off, tapping, chamfering milling etc. Finally, these are hardened and are given a rust preventive coating.

IV. Inspection and Quality Control

ISI has laid down specifications No. IS: 629-1963 and No. IS: 628-1963 for this assembly and Pedal assembly respectively. Some may be followed for inspection and quality control.

V. Land & Building

	Rs.
Land 200 sq. metres.	500.00
Covered area 100 sq. metres	
Rented @ Rs. 500/-p. m.	

VI. Machinery & Equipment

(1) Hub Cone Cutting Machine 20 mm Collet capacity with 2 H. P. Electric Motor & Starter.	4 Nos	24,000.00
(2) Pedal cone cutting machine 20 mm collet capacity with 2 H. P. elect. motor & starter	4 Nos.	24,000.00
(3) Cone tapping machines with 1 H. P. electric motor & Starter.	3 Nos.	7,500.00

(4) Milling Machine for Hub Cone Milling (special purpose) with 1 H. P. Elect. motor & starter.	2 Nos.	5,000.00
(5) Milling Machine for Pedal cone slotting (special purpose) with 1 H. P. electric motor & starter.	1 No.	2,000.00
(6) Bench Drilling Machine 20 mm capacity with 1.5 H. P. Elect. motor & Starter.	1 No.	3,500.00
(7) Bench grinder 200 mm, 0.75 H. P.	1 No.	1,500.00
(8) Polisher 2 H. P. capacity.	1 No.	3,000.00
(9) Workshop Tolls, equipments & gauges	L. S.	5,000.00
(10) Election & installation charges.	L. S.	7,000.00
(11) Office furniture & equipments.	L. S.	2,000.00
Total		Rs 84,500.00
Say		Rs 85,000.00

VII. Raw Material Requirements (P. M.)

M. S. Drawn & straightened bars 15.87 & 17.46 MM dia. 8 tons	24,000.00
Rs. 3000/-	

VIII. Staff & Labour (Per Month)

(1) Foreman	1 No.	600.00
(2) Skilled workers	8 Nos.	2,400.00
(3) Semi-skilled	6 Nos.	1,500.00
(4) Helper	1 No.	200.00
(5) Chowkidar/peon.	1 No.	200.00
(6) Sweep Part time.	1 No.	50.00
(7) Accountant/clerk part-time	1 No.	200.00
Total		5,150.00
Say Rs.		5,200.00

IX. Other Expenses (Per Month)

	Rs.
(1) Electricity & water . . .	625· 00
(2) Consumable tools . . .	500· 00
(3) Oils & Iubricants. . .	200· 00
(4) Heat treatment charges . .	4,500· 00
(5) Auto Blakening/zinc plating	1,500· 00
(6) Postage stationery . . .	100· 00
(7) Cartage, freight etc. . .	200· 00
(8) Rent	500· 00
(9) Travelling expenses . . .	200· 00
(10) Misc.	100· 00
Total	8,425· 00
Say Rs.	8,400· 00

X. Working Capital Required for (3 months)

	Rs.
(1) Raw Materials . . . 24000 × 3	72,000· 00
(2) Salaries & wages . . . 5200 × 3	15,000· 00
(3) Other Expenses . . . 8400 × 3	25,200· 00
Total	1,12,800· 00

XI. Total Capital Investment

	Rs.
(1) Total fixed investment on machinery & equipment	85,000· 00
(2) Working Capital for three months	1,12,800· 00
Total	1,97,800· 00
Say Rs.	1,98,000· 00

XII. Cost of Production (Per Annum)

(1) Recurring Expenses. 1,12,800· 00 × 4	4,51,200· 00
(2) Interest on capital @15%.	29,700· 00
(3) Depreciation on Machinery & equipment @10%	8,500· 00
(4) Sales & packaging expenses L. S.	9,000· 00
Total	4,98,400· 0
Say Rs.	4,98,500· 00

XIII. Sales Proceeds (Per annum)

	Rs.
(1) Bysale of 11760 gross hub cones @ Rs. 30/- and 11760 gross pedals Cones @ Rs. 15/-	5,29,200· 00
(2) By sale of scrap 28· 8 tons @1000.	28,800· 00
Total	5,58,000· 00

X. Profit (Per Annum)

$$\text{Profit} = \text{Total Sales} - \text{Cost of Production} \\ = 5,58,000· 00 - 4,98,500· 00 = 59,500· 00$$

(a) Percentage of profit on sales

$$\frac{59,500}{5,58,000} \times 100 \\ = 10· 66\%$$

(b) Percentage of return on investment

$$\frac{59,500}{1,98,000} \times 100 \\ = 30· 05\%$$

XV. Break Even Analysis

$$\text{B. E. P.} = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual fixed cost puls profit}}$$

Fixed Cost (Per Annum)

(1) Rent	6,000· 00
(2) Interest on capital	29,700· 00
(3) Depreciation	8,500· 00
(4) 40 % of salaries	24,960· 00
(5) 40% of other expenses (Excluding H. T. & Auto Black charges)	11,640· 00

Total	80,800· 00
Say Rs.	81,000· 00

$$\text{B. E. P.} = \frac{81,000 \times 100}{81,000 \times 59,500} = \frac{1,09,500 \times 100}{1,40,500} \\ = 57\% \text{ approx.}$$

XVI. Names and addresses of suppliers of machinery & equipments.

- (1) M/s. Jaimal Mechanical Works, Jaimal Road, Janta Nagar, Industrial Area-B, Ludhiana.
- (2) M/s. Batliboi & Co. (P) Ltd., 190-A, Forbes Street, Bombay.
- (3) M/s. Rajan Machine Tools, 4-R, Industrial Area-B, Ludhiana.
- (4) M/s. Millhard & Co. (P) Ltd., G. T. Road, Miller Ganj, Ludhiana.

(Reserved item Sl. No. 697)

I. Product and its uses

Blacksmith's Hearth are made of Sheet metal for burning coal in order to facilitate heating of raw material to be forged or formed to different shapes by blacksmiths. The hearth also contain a hand blower for supply of air, cast iron pipe fittings and has a stand made of tubes so that the hearth height is convenient to heat the raw materials.

The most simple round shaped hearth is taken for manufacture in this profile as they are cheap and simple and can find market even from Artisan type Blacksmithy units and thus there will be a better market. The hearth has got a diameter of 18" and height of 8".

II. Market Potential

The blacksmith's hearths are normally used by artisans, educational Institutions like Engineering Colleges, Industrial Training Centres, Technical Schools for their Blacksmithy Section. In educational Institutions, the hand blower may be replaced by power blower or separate air supply source. Therefore the hearths for educational Institutions have to be supplied with necessary cast iron pipe fittings only and not with hand blower. This procedure will allow this unit to have a wider marketing Area. When the hearth is supplied without hand blower, the price of the hearth may be reduced by an amount equal to the cost of the hand blower.

III. Production Target

It is proposed to manufacture 75 Nos. of blacksmithy hearths per month in this unit.

IV. Production details and process of manufacture

The B.P. Sheets are cut to different sizes and shapes with the help of hand lever shear. The sheet for hearth is bent circumferentially to convert the sheet into tubular form. Three lugs are rivetted to the sides of the tubular ring and over these lugs, the bottom plate is fixed with bolts and Nuts. The cast Iron pipe fittings, the pipe stand and castings are assembled. The hand blower also is fitted. The hearth is then painted.

V. Inspection and Quality control

The pipe fittings should be assembled so that there is no leakage of air when the hand blower is

worked. The pipe stands should be well assembled so that the hearth will not be in an inclined position.

VI. Land and Building

	Rs.
Covered Area 100 sq. meters (rented)	500·00

VII. Machinery and Equipment

(1) Lever Shear 12" blade	1	850·00
(2) Pipe bending machine cap. with formers	1	1,000·00
(3) Bench drill 1½" ½" dia.	1	1,500·00
(4) Bench grinder 10" dia.	1	1,500·00
(5) Hand tools, measuring instruments marking tools etc.	—	3,000·00
(6) Office furniture and equipment		1,550·00
(7) Installation and electrification		600·00
Total		10,000·00

VIII. Raw Materials (per Month)

(1) B. P. Sheets 14 SWG 825 K.G.	3,280·00
(2) Purchased items such as Blowers, castings pipes, hard ware items	8,250·00
Total	11,530·00

IX. Staff and Labour (per Month)

(1) Skilled worker	1	400·00
(2) Semi-skilled worker	1	250·00
(3) Helpers	2	400·00
(4) Office Staff	1	300·00
(5) Welfare facilities	—	150·00
Total		1,500·00

X. Other Expenses (Per Month)

	Rs.
(1) Rent	500·00
(2) Electricity & water	75·00
(3) Consumable tools	100·00
(4) Consumable stores	400·00
(5) Cartage and freight	100·00
(6) Publicity expenses	100·00
(7) Sales expens including travelling.	200·00
(8) Stationery, postage and miscellaneous Expn.	125·00
Total	1,600·00

XI. Working Capital (Per Month)

	Rs.
(1) Raw materials	11,530·00
(2) Staff & Labour	1,500·00
(3) Other expenses	1,600·00
Total	14,630·00

XII. Total Capital Investment

	Rs.
(1) Machinery & equipment	10,000·00
(2) Working capital for 3 months	43,890·00
Total	53,890·00
Say	53,900·00

XIII. Manufacturing Cost (Per Month)

	Rs.
(1) Raw material	11,530·00
(2) Staff & Labour	1,500·00
(3) Other expenses	1,600·00
(4) Depreciation on machinery & equipment @10%	84·00
(5) Interest on capital@15%	672·00
Total	15,386·00
Say	15,400·00

XIV. Total Sales (Per Month)

	Rs.
By sale of 75 hearths at Rs. 225/- each.	16,875·00

XV. Total Profit—(Per Month)

Profit=Total Sales—Manufacturing Cost.

=Rs. 16875—15400

=Rs. 1475·00

(a) Percentage of profit on Bales.

$$\begin{aligned} & \frac{\text{Profit per month}}{\text{Sales per month}} \times 100 \\ & = \frac{1475}{16875} \times 100 \\ & = 8\cdot74\% \end{aligned}$$

(b) Percentage of profit on capital investment.

$$\begin{aligned} & \frac{\text{Annual profit}}{\text{Total capital investment}} \times 100 \\ & = \frac{1475 \times 12}{53900} \times 100 \\ & = 32\cdot84\% \end{aligned}$$

1. Break Even Analysis

Break even percentage

$$\begin{aligned} & \frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100 \end{aligned}$$

Fixed cost per month

	Rs.
(1) Rent	500·00
(2) 40% of staff & labour	600·00
(3) 40% of other expenses excluding rent	440·00
(4) Depreciation on machine & equipment	84·00
(5) Interest on capital investment	672·00

Total 2,296·00

Say 2,300·00

Annual fixed cost

=Rs. 2300 × 12

=Rs. 27600·00

Break even percentage

$$\begin{aligned} & \frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100 \\ & = \frac{27600}{27600 + 17700} \times 100 \end{aligned}$$

27600

$$= \frac{27600}{45300} \times 100$$

45300

=60·92%

Say 61%

XVII. Names and Addresses of Suppliers of Machinery and Equipment

(1) Machine Tools Traders (Cal.,)
25, Ganesh Chandra Avenue,
CALCUTTA-700013.

(2) Machine Bazar,
130, Meadows Street,
Bombay-400023.

(3) International Machine Tools Corporation,
5, Bank Street,
Behind State Bank of India,
Fort,
BOMBAY-400023.

XVIII. Name and Address of Suppliers of Raw Materials

(1) Any nearest branch of Steel
Authority of India Ltd.

(Reserved item Sl. No. 496).

I. Products and their uses

There are many types and sizes of bolts and screws which are used on bicycles. Bicycle industry has very good scope in our country at least for the next two decades, because of the increasing demand for cycles by general masses whose living standard is going up year after year. The demand for cycles even in the developed countries is increasing at about 10 per cent per annum. Therefore there is very good scope for the bicycle and parts industry. Thus bolts and screws used on bicycles too have good scope.

II. Production Targets

It is proposed to manufacture 1.2 million bolts and screws per month, of which 4.5 lacs will be bolts and 7.5 lacs will be screws.

III. Production details and process of manufacture :

The maximum size of bolt being used in bicycle is the seat stay bolt of 5/16" × 2-1/2" long. Other smaller bolts are 5/16" Dia. cycle thread and 1-1/2" long used in bicycle saddle. The screws used are Mudguard screws 3/16" Dia. B.S.W. and 1" and 1-1/2" long. This scheme deals with the manufacture of above two types of bolts and two sizes of screws only. For the manufacture of bolts the required size of wire is fed into a double stroke cold heading machine. The round heads so formed are trimmed on an automatic bolt head trimming machine and then the threads are formed on a thread rolling machine. After that the bolts are electroplated in a Zinc barrel and then are ready for use. For screws, the heading operation is done on a double stroke cold heading machine and then fed to automatic screw head slotting machines. After that the slotted blanks are roll-threaded and finally electroplated for completing the manufacturing cycle. Normally 3/8" size heading machine gives 50 to 60 pieces per minute and 3/16" × 1-1/2" screw headers give 80 to 90 strokes per minute.

IV. Inspection and Quality Control

There are Indian and B.S.W. standard specifications available for all 3 types of bolts and screws proposed to be made in this scheme. The specification number are:—

I.S.—2728-1964 for seat stay bolts.

To achieve the desired standards of bolts and screws, quality control at every stage is a must. The following sequence may be followed:—

1. Chemicals analysis of incoming raw materials i.e H.B. Wire. In absence of this test, a copy of the test certificate from the suppliers of wire rod may be obtained from the wire drawing units from whom H.B. wire has been purchased.
2. Checking the diameter of the wire for its proper size.
3. Checking the dia. of blank bolts and screws to see that the heading die hole is of proper size.
4. To check the trimmed sizes of Hexagonal heads of the bolts.
5. To check the O.D. of bolts and screw threads as well as to check those with screw ring gauges for their proper effective dia.

V. Land and Building

Covered area	250 sq.	
Metres.		90,000 '00
(Cost of land Rs. 25,000/- and building Rs. 65,000/-)		

VI. Machinery and Equipments**(A) Machinery**

- (1) Double stroke cold heading machine 3/8"—3" cap. complete with electric motor 10 H. P. starter etc. 1 No. 35,000 '00
- (2) Double stroke cold heading machine 3/16"—1 1/2" cap. complete with electric motor 5 H. P. starter etc. 1 No. 25,000 '00
- (3) Bolt head trimming machine 3/8" capacity complete with 5 H. P. motor 1 No. 18,000 '00

	Rs.
(4) Screw head slotting machine 3/16" capacity with automatic feed and electric motor 1H. P. each with starter etc. 2 Nos.	16,000·00
(5) Thread rolling machine 3/8" cap. complete with automatic feed and electric motor 3 H. P. and starter. 1 No.	5,000·00
(6) Thread rolling machine complete with automatic feed and electric motor 2 H. P. with Starter. 1 No.	10,000·00
(7) Zinc plating plant—250 Amp.—12 volts complete with rectifier tanks zinc barrel, centrifugal drier etc.	20,000·00
(8) Lathe machine 1500 mm. bed length and 150 mm Ht. of centres complete with 2 H. P. electric motor 1 No.	8,000·00
(9) Bench grinder 200 mm. dia wheel motorised 1 No.	1,500·00
(10) Bench drilling machine 1/2" cap. motorised with electric motor 1 H. P. and starter. 1 No.	2,000·00
(11) Tools, dies, Precision Measuring Instruments etc. L. S.	2,000·00
(12) Installation and electrification charges @10% of the cost of machinery	15,000·00
(13) Office furniture, fixtures and equipment	4,000·00
Total	1,71,500·00
Say	1,72,000·00

VII. Raw material requirements (per month)

(1) H. B. wire for 5/16" dia. bolts and 5/16" Dia. Hex bolts for 4·5 lac. pcs. @Rs. 3200/-per tonne 10 M. T.	Rs.
	32,000·00
(2) H. B. Wire for 3/16" Dia. screws—7·5 lac pieces @Rs. 3300/-per Tonne for 5·5 M. T.	Rs.
	18,150·00
Total	50,150·00

VIII. Staff and Labour (per month)

	Rs.
(1) Manager 1	600·00
(2) Foreman 1	600·00
(3) Skilled Workers 5	1,750·00
(4) Semi-skilled worker 4	1,000·00
(5) Helpers & unskilled workers 3	600·00
(6) Chowkidar 1	200·00
(7) Part-time Accountant-cum-clerk 1	200·00
	4,950·00

IX. Other expenses (Per month)

	Rs.
(1) Electricity & water	1,200·00
(2) Oils & Lubricants	500·00
(3) Consumable tools & dies	3,000·00
(4) Packing expenses	2,500·00
(5) Postage & stationery	400·00
(6) Travelling, Transportation and cartage.	600·00
(7) Unforeseen expenses	500·00
(8) Electroplating chemicals and salts etc.	5,000·00
	13,700·00

X. Working capital required (for 3 months)

	Rs.
(1) Raw materials	1,50,450·00
(2) Salaries & wages	14,850·00
(3) Other expenses	41,100·00
Total	2,06,400·00
Say	2,07,000·00

XI. Total Capital Investment

(1) Land & Building	90,000·00
(2) Machinery & equipment	1,72,000·00
(3) Working capital	2,07,000·00
Total	4,69,000·00

XII. Cost of production (Per annum)	Rs.
(1) Recurring expenses	8,28,000· 00
(2) Interest on total capital@ 15%	70,400· 00
(3) Depreciation on plant & machinery @10%	17,200· 00
(4) Depreciation on building @5%	3,300· 00
(5) Sales expenses@2% on sales	25,000· 00
Total	9,43,900· 00

XIII. Sales Proceeds (per annum)	
(After allowing 3% rejection)	
(1) By Sale of 5/16'' × 2-1/2'' Bolts 29.10 lac pcs. @Rs 24/-per hundred pcs.	Rs 6,98,400· 00
(2) By sale of 23.28 lac. pcs. of 5/16'' × 1-1/2'' size bolts @Rs. 14/-per 10. Pcs.	3,25,920· 00
(3) By sale of 87.30 lac Pcs. of 3/16'' × 1'' screws @Rs. 2/- per 100 Pcs.	1,74,600· 00
Total	11,98,920· 00
Say	11,98,900· 00

XIV. Profitability (per annum)

Profit=Sale minus cost
of production

$$=11,98,920-9,43,900$$

$$=2,55,000$$

(a) Percentage of profit on
sales—

$$\frac{255000 \times 100}{1198900}$$

$$=21.26\%$$

(b) Percentage of return on
capital investment

$$\frac{255000 \times 100}{469000}$$

$$=54.37\%$$

XV. Break Even analysis

$$B. E. P. = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{profit.}}$$

Fixed cost (Annual)

	Rs.
(1) Interest on capital	70,400· 00
(2) Depreciation on machinery	17,200· 00
(3) Depreciation on building	3,300· 00
(4) 40% of salaries	23,760· 00
(5) 40% of other expenses	65,760· 00
Total	1,80,420· 00
Say	1,80,400· 00

$$B. E. P. = \frac{180400 \times 100}{180400 + 255000}$$

$$=41.43\%$$

XVI. Names and addresses of suppliers of machinery and equipment

- (1) M/s. Batliboi & Co. (P) Ltd.
190-A, Forbes Street,
BOMBAY-400001.
- (2) M/s. Perfect Machine Tools
Co. (P) Ltd., Bell Build-
ing, Sir P. M. Road,
Bombay-400001.
- (3) M/s K. B. Machine Fac-
tory, Sultanwind Road.
Amritsar (Punjab).
- (4) M/s Devindra Industries,
693-Industrial Area 'B'
Ludhiana-141003.
- (5) M/s Sarbjit Industries,
Ram Tirath Road,
Amritsar.
- (6) M/s Maneklal & Sons,
Narayan Dhuru Street,
Bombay.

(Reserved item Sl. No. 690).

I. Products and Its Use

Bulb horn is extensively used in light vehicles like Rickshaw, School van etc. With the growth of population the demand of the item particularly in suburban & urban areas are increasing gradually. All the material required for manufacturing the items are indigenously available and process of manufacturing is also very simple.

II. Market Potential

It is a general consuming item for actual manufacturer or vehicle owner. With normal wear and tear the horn wears out in about a year and a new one is necessary for replacement. Demand is considered fair in the market.

III. Production Target

Keeping in view of small target as well as investment and other aspect, production frate have been kept around 100 nos./day.

IV. Product Details and Process of Manufacture

General sheet metal machinery are required for manufacturing the item. The main consuming raw materials are M.S. Sheet (24 SWG & 26 SWG), M.S. Pipe, Rubber bulb etc.

After cutting into sizes by hand shearing machine, M.S. Sheet is first placed in press machine for making blanks and subsequent folding operation is done to form a conical shape. The edges are to be welded. Then M.S. Pipe is cut into required sizes, fitted tightly and welded with conical shaped body. A horn also welded with M.S. Pipe. Finally a rubber bulb is to be fitted to complete the product.

1. Shearing into sizes.
2. Press operation and folding.
3. Welding.
4. Fittings.
5. Painting.

V. Inspection and Quality Control

Since the product has got several components to be assembled together, it is advisable to check up every stage of operation. In press machine strict vigilance is necessary to assure quality of finish by

way of proper setting of tools and a timely adjustment of them. Assembled horn is finally tested by hard squeezing for proper performance.

VI. Land and Building

Office & workshop (covered area)
600 sq. ft. Rented Rs. 150,00/
month.

VII. Machinery and Equipment

	Rs.
(1) Hand shearing machine 1 No.	500.00
(2) Hand press No. 8 1 No.	1,000.00
(3) Baby Caps tan lathe bar capacity 3/4" with 1 H.P. motor 1 No.	3,000.00
(4) D.E. Grinding machine 6" dia. 1 No.	2,000.00
(5) Gas welding set (including security for cylinder) 1 No.	2,000.00
(6) Other tools L.S.	1,000.00
	9,500.00
Electrification & installation	1,000.00
	10,500.00

VIII. Raw Material (per month)

	Rs.
M. S. Sheet—24 SWG —100 kg. @3.50/kg.	350.00
M.S. Sheet—26 SWG —25 kg. @3.50/kg.	87.50
M.S. Pipe 1/2" dia. 300 ft. @1.00/ft.	300.00
M.S. Pipe 3/8" dia. 125 ft. @0.80/ft.	100.00
Rubber bulbs—2500 pcs.	1,000.00
Screw—L.S.	100.00
Horn reed @15—100 nos.	375.00
Total	2,312.50
Say	2,300.00

Staff and Labour (Per Month)

Manager cum Supervisor	1 no.	@400.00	400.00
Skilled worker	1 no.	@300.00	300.00
Machinist	1 no.	@300.00	300.00
Semi-skilled	1 no.	@200.00	200.00

1,200 00

Cost of labour benefit @10%

120 00

TOTAL . 1,320.00
Say Rs. . 1,300 00

X. Other Expenses (Per Month)

	Rs.
(1) Rent	150 00
(2) Electricity	70 00
(3) Consumable tools	100 00
(4) Lubricants & other consumable store	100 00
(5) Maintenance	50 00
(6) Cartage & freight	25 00
(7) Packing cost, publicity	50 00
(8) Sales expenses including travelling	50.00
(9) Stationery, postage, insurance	50.00
(10) Insurance legal charge fees, licences etc.	50.00
Total	695.00
Say Rs.	700.00

XI. Working Capital (Per Month)

Raw material	2,300.00
Staff & labour	1,300.00
Other expenses	700.00
Total Rs.	4,300.00

XII Total Capital Investment

(1) Machinery & equipment	10,500.00
(2) Working capital for 3 months (4300x3)	12,900.00
Total	23,400.00

XIII. Cost of Production (Per Annum)

	Rs.
(1) Raw material	27,650.00
(2) Staff & labour	15,600.00

Rs.

(3) Other expenses	8,400.00
(4) Interest on capital @ 15%	3,510.00
(5) Depreciation on m/c @10 %	1,050.00

Total 56,210.00
Say Rs. 56,000.00

XIV. Total sale (per Annum)

(1) By sale of 30,000 nos of horns @ 2.20 per P.C.	66,000.00
--	-----------

XV. Profitability (Per Annum)

Total sale—Cost of production
= Profit
66,000.00 — 56,000.00
= 10,000.00

(a) Percentage of Profit on sale

$$\frac{10,000 \times 100}{66,000} = 5 \%$$

(b) Percentage of return over investment

$$\frac{10,000 \times 100}{23,400} = 42 \%$$

XVI. Break Even Analysis

Annual fixed cost

	Rs.
(1) Rent	1,800.00
(2) Interest	3,510.00
(3) Depreciation of m/c	1,050.00
(4) 40 % of salary	6,240.00
(5) 40 % of other expenses	2,640.00

Total 15,240.00
Say Rs. 15,000.00

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{Annual profit}}$$

So break even %

$$= \frac{15,000 \times 100}{15,000 + 10,000} = 60 \%$$

Source of Machinery

- (1) M/s. Nandy & Co.,
125, Belilious Road,
Howrah.
- (2) M/s. Indian Oxygen Ltd.,
48/1, Diamond Harbour Road,
Calcutta.

(Reserved item Sl. No. 628)

CAMBER TESTING EQUIPMENT

Introduction

Camber testing equipment is used to measure deflection of any curved or elliptical flat spring for its resillience. An automobile leaf spring is a common example and in its performance test, they are subject to cambering test during manufacture.

Camber testing machine usually consist of a Hydraulic Press. With a ram actuated up and down. In form the ram hydraulic load cell with a plate diaphragm assembly in an enclosed system consisting of a diaphragm chamber, Capillary and Boun-den tube in the indicating Dial instrument calibrated directly in wright units of Kgs. and tons.

When the ram decends down and load is applied, a pressure is built up in the chamber equal to the applied load divided by the effective diaphragm area. The pressures indicated in the indicator.

The spring to be tested area mounted by pivating on the ends of the spring duly supported with blocks and the load is applied in the centre of the spring. The deflection is complete in reverse and the load is released and the chamber height is measured, to find out the difference with certain allowable limits to en-sure proper resillience of the spring.

The machine body is made of C.I. castings and hydrator ram is acted by a cylinder operated under pressure by a pump or motor to build up pressure and actuate the rams up and down. The bed is machined and is perpendicular to the ram head.

B. Basis and Presumption

The product design is based on building of the Hydraulic cell indicator type for weight load indica-tor, model. Other types of designs for indication are available and accordingly the Estimate can be incorporated. The Indicator Dial direct reading type generator in Kgs. are for cap. upto 15 tons. Load application may be procured from outside sources. So also Hydraulic system can be procured from out-side.

C. Financial Aspects;

Fixed Capital

	Rs.
(i) Land and Building Rented	800.00 p.m.
Covered area required	500 sq. metres
(ii) Machinery Equipment	
(1) Machine with motor Sharada Make	30,000.00
(2) Heavy duty lathe Shimoga 8/ Gap bed with Electric Motor & Accessories. 1 No.	32,000.00
(3) Heavy duty Drilling Machine 1" Cap. to drill 1 No.	6,000.00
(4) Die Bench Grinder 1 No.	1,500.00
(5) Horizontal Milling Machine Hand Operated 1 No.	8,000.00
(6) Air Compressor with 1 No. Spraying equipment	6,000.00
(7) Hand Press No. 6 . 1 No.	1,500.00
(8) Hand Operated Sur- 1 No. face Grinder	12,000.00
(9) Shaping Machine 24" Stoke with Motor and necessary DMK Make 1 No.	18,000.00
(10) Measuring Instru- ments, Tools, Drill bits etc. . L/S.	4,500.00
(11) Testing Equipments such as guages, Pattam etc.	3,500.00
(12) Electrification & Ins.	1,23,000.00

(B) Working Capital (Per Month)**(i) Personnel**

		Rs.
Works Manager/Foreman	One	800.00
Skilled workers	Five	1,500.00
Semi-Skilled Workers	Four	1,000.00
Clerk/Typist	One	350.00
Accountant/storekeeper	One	500.00
Watchman /Peon	Two	400.00
		<u>4,550.00</u>

(ii) Raw Materials/PM

Castings	5 tons	10,000.00
Bought out items such as Hydraulic Castings, Dial indicator size of dia 18" dia for cap. upto 15 ton, bolts & nuts etc., such as Motors, Rubber House Pipes, Motor etc.		10,000.00
Sub-contract work, for plating, heat treatment, foundry etc.		2,000.00
		<u>22,000.00</u>

(iii) Utilities (Per Month)

	Rs.
Power	300.00
Water	50.00
	<u>350.00</u>

Other Contingent expenses, PM

Rent	800.00
Transport	550.00
Insurance	50.00
Telephone	300.00
Repairs/Renewals	50.00
Cotton waste & Other consumables.	150.00
	<u>1,900.00</u>

Working Capital/PM

(1) Raw Materials	21,350.00
(2) Staff & Labour	4,550.00
(3) Misc. Expenses	4,500.00
	<u>28,500.00</u>

For 3 months 86,400.00

Total Capital Investment

(1) Cost on Machinery.	1,23,000.00
(2) Working Capital/3 months	86,400.00
	<u>2,09,400.00</u>

Production Cost/PA

Working Capital	3,45,600.00
Depreciation on Machinery @ 10 % P.A.	12,300.00
Interest on Capital @ 15 % P.A.	31400.00
	<u>Total</u>
Say Rs.	3,89,300.00
	<u>3,90,000.00</u>

(5) Turnover (Per Year)

	Rs.
By sale of 36 machines @ 15,000/-	5,40,000.00
Profit = 5,40,000 — 3,89,300	
	<u>= 1,50,700.00</u>

Sale Commission	36,000.00
Net Profit Subject to taxes	<u>1,14,700.00</u>

Break-even point

80 % of the production capacity.
In terms of value
4 lakhs P.A.

Address of the Machinery Suppliers

- (1) M/s. Hindustan Machine Craft., Unity Buildings, Bangalore-2.
- (2) M/s. Quality Machine Tools, V.V. Puram, Bangalore-4.
- (3) M/s. Jayems Engg. Company, S.J. Park Road, Bangalore-2.
- (4) M/s. Batliboi Pvt. Ltd., Bangalore-2.

(Reserved item Sl. No. 676)

I. Product and its uses

The cable drum is a widely used item by cable/conductor manufacturers for transmission line, for telephone line cable/conductor etc. to carry specified length of cable/conductor from factory floor to site of cable/conductor laying. This is a spool for winding cable/conductor in layman's words. The construction is wooden with suitable steel reinforcement.

II. Market Potential

There are quite a number of cable/conductor manufacturers throughout the country. Through contacts with M/s. Hindusthan Cables Ltd., at Rupanarayanpur, Dist. Burdwan which is one of the major manufacturer of cables has been ascertained that for this plant alone annual requirement of drums are about worth Rs. 84,00,000/-. Total demand in the country will be worth several crores. With Nation wide programme for rural electrification requirement of conductors is fast growing. So is growing prospect of marketing cable drums.

III. Production Target

Production target is fixed at 300 pcs. of cable drums per month on the basis of single shift working and on average 25 working days per month.

IV. Product details and process of manufacture

The scheme is based on manufacturing cable drums of 42" dia which is a popular size with intensive use for both conductors and cables. Timber, M.S. Round & plates, wirenails, nuts, bolts, washers, wood preservative paints are required for its manufacture. The whole drum is built up with the following components.

- (1) Wooden drums.
- (2) Flanges on both sides.
- (3) Metal plates on both sides and tie rods for fixing the drums with flanges.

Timbers are sawn to sizes as per specification and assembled by nailing. During final assembly the drum is assembled with flanges by insertion of tie rods through metal plates and fastened with nuts.

V. Inspection and quality control

The Check is necessary to ensure proper supply of raw materials free from defects, knots, saps, split. During procuring of timber dimension is checked as per specification and drawing. No major inspection is called for production of this item.

VI. Land and building

Office and workshop covered area
300 sq. metre rented @ Rs. 1800
per month.

VII. Machinery equipment

1. 42" Verticle Band saw machine with table, complete with 10 H.P. motor other Elec. equipments.	17,000.00
2. 24" circular saw complete with 10 H.P. motor and other accessories.	9,000.00
3. Saw sharpner & setter (combined) with 1.5 H. P. motor	3,000.00
4. Electric Brazing m/c for 3" Blades	1,500.00
5. Double ended Beach grinder 15 x 1" with 2 H.P. motor	2,500.00
6. Wooden Drum twinning lathe m/c 3" centre x 3" long.	5,000.00
7. Gas Cutting set.	2,000.00
8. Welding transformer Set (For tacking purpose of tie rods with nuts).	3,500.00
9. Set of various tools, crow bars, and 1 roll of Band saw Blade 3" x 10 swg.	2,000.00
10. Moisture reading meter	1,500.00
11. Wood Boring m/c. with 2 H.P. motor	3,000.00
12. Installation and Electrification.	8,000.00
13. Office Equipments.	2,000.00
	60,000.00

VIII. Raw materials per Month

1. Cost of soft wood 1500 cft. calculated on the basis 5 cft. per drum @ 15/-per cft.	22,500·00
2. Cost of M. S. tie rods with nuts 1200 Nos.	1,800·00
3. Cost of M.S. washer & plates 600 Nos.	1,800·00
4. Cost of wire nails	500·00
5. Cost of wood preserving paint	200·00
6. Other Consumer goods for m/c maintenance.	400·00
	<u>27,200·00</u>

IX. Staff labours per Month

1. Manager 1 No.	700·00
2. Foreman Supervisor 1 No.	500·00
3. Store Keeper / Accountant 1 No.	300·00
4. Skilled operators 3 Nos.	1,200·00
5. Semi Skilled operations. 3 Nos.	900·00
6. Unskilled operators. 8 Nos.	1,600·00
7. Watchman-cum-Peon 1 No.	200·00
	<u>5,400·00</u>
Cost of labour benefits @10%	540·00
	<u>5,940·00</u>

X. Other Expenses per Month

1. Rent	800·00
2. Electricity	200·00
3. Consumable tools	200·00
4. Lubricants & Other Consumable Stores	100·00
5. Carriage & Freight	1000·00
6. Maintenance	200·00
7. Publicity	100·00
8. Sales expenses including travelling	300·00
9. Stationery, Postage, Insurance, legal charges, Fees, licences and other Misc. expenses.	100·00
	<u>3000·00</u>

XI. Working Capital required per month.

1. Raw materials	27,200·00
2. Staff & labour	5,940·00
3. Other Expenses	3,000·00
	<u>36,140·00</u>

XII. Total Capital Investment

1. Machinery & Equipment	60,000·00
2. Working Capital for 3 months.	1,08,420·00
	<u>1,68,420·00</u>
Say	<u>1,68,400</u>

XIII. Cost of Production (per annum)

1. Raw material	3,26,400·00
2. Staff & Labour	71,280·00
3. Other Expenses	36,000·00
4. Interest on capital 15	25,263·00
5. Depreciation on machinery 10%	6,000·00
	<u>4,64,943·00</u>
Say	<u>4,64,900·00</u>

XIV. Total sale (per annum)

1. By sale of 3600 Nos. of wooden cable drums on average price Rs 145/- each	5,22,000·00
Fire wood	5,000·00
	<u>5,27,000·00</u>

XV. Profitability (per annum)

Total Sale—Cost of production=	
Profit=Rs. 5,27,000—4,64,900=62,100·00	
a. Percentage of profit on sale Rs. $(62,100 \times 100) \div 5,27,000$	11%
b. % age of return over investment Rs. $(62,100 \times 100) \div 1,68,400$	36%

XVI. Break even analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{(\text{Annual fixed cost} + \text{Annual profit})}$$

Fixed cost (per annum)

1. Rent	9,600. 00
2. Interest	25,263. 00
3. Depreciation on M/c Equip- ment	6,000.00
4. 40% of salaries	28,512. 00
5. 40% of other expenses (exclud- ing rent)	10,560. 00
	79,935. 00

$$\begin{aligned} & \frac{79935 \times 100}{\text{B.E.P.B.}} = 55\% \text{ (Approx.)} \\ & = 79935 + 62100 \end{aligned}$$

Name & Addresses of Machinery suppliers

1. M/s. Sugga Engg. Wks. P. Ltd. 8/39, South Indl. Area, Kirtinagar, New Delhi.
2. M/s. The Bharat Mechanical Wks. (Regd.), G.T. Rd., Batala.
3. M/s. Bharat Egg. Wks., West Hiu, Calicut.
4. M/s. Batliboi & Co. (P) Ltd., 26, R.N. Mukherjee Rd. Calcutta-1.
5. M/s. Bharj Engg. Co., 26, Canal West Road, Calcutta-4.

I. Product and its uses

The Metric weights are usually divided in three categories viz. Cast Iron, Brass and Sheet Metal. Sheet Metal weights are divided again under three categories i.e. Bullion weights, Non-Bullion weights and carat weights. The present scheme envisages manufacture of Cast Iron metric weights. These are used mainly in weighing balances in trade and industry.

II. Market Potentials

With the increase of population, the scope of trade and industry is also increasing. Since weighing balances are cheapest amongst the weighing devices, there is extensive use of these balances not only in small business places but also industrial units. There are several units engaged in manufacture of metric weights. With the advent of more and more industry and business activity, the demand for metric weights is increasing.

III. Production Target

The proposed production target for manufacture of C.I. weights is 50 M.T. per month i.e. 50 per cent of installed capacity.

IV. Product details and process of manufacture

The C.I. weights are manufactured from 50 K.G. to 50 gms. denominations. Usually C.I. scraps are melted in Cupola Furnace and poured in previously prepared moulds made of green moulding sands. The castings on solidification are knocked out of the sands and the runners and risers are fettled out. The shape and weight of the castings are kept strictly according to ISI specifications. Before marking, little lead is put in the weights as stipulated by the specifications.

V. Inspection and quality control

The technical requirements for the commercial metric weights are given in IS: 1056-1965 (revised). The manufacturer of metric weight is required to obtain a Licence from the Controller, Weights & Measures renewable year to year. A stipulated fee of Rs. 100/- is levied for the same. The stamping mark on weights are valid for two years and the same are verified in every two years. The weights used in 'hats' and markets are required to be verified once

in two years. But, the weights used by industries and manufacturers are required to be verified every year.

VI. 1. Land and Building

Covered area 2400 sq.ft. 9	Rented
Office 400 sq. ft.	
Open area 3000 sq. ft.	

VII. 2. Plant and Machinery

(a) Cupola 2 Tons Capacity with suitable capacity bare shaft motor including fire brick lining, fire clay steel connecting Pipe and Platform	1 No.	50,000
(b) Sand Muller, 150 Kg. batch capacity.	1 No.	9,500
(c) Laddles Capacity 100 Kg.	2 Nos.	3,000
50 "	2 "	
20 "	2 "	
(d) Moulding Boxes of assorted sizes	L.S.	3,000
(e) Flexible shaft grinder with 4" wheel	1 No.	1,000
(f) Weighing Machine (Platform type) 1 Ton Capacity		2,500
(g) Patterns	L.S.	1,500
(h) Moulding Tools etc.	L.S.	500
(i) Office equipment	L.S.	3,000
(j) Installation Cost	L.S.	5,000
	Total	79,000

VIII. Raw Materials and Consumable / month

	Qty.	
(a) C.I. Scraps like skull scraps etc. @ 650/-	60 M.T.	39,000/-
(b) Hard coke @ 450/-	15 "	6,750/-
(c) Lime Stone @ 150/-	5 "	750/-
(d) Steel Rods	L.S.	400/-
(e) Lead	L.S.	1,200/-
(f) Plumba-go, Bentonite, fire clay, fire bricks etc.	L.S.	900/-
		49,000/-

IX. 4. Staff and Labour/month

(a) Foreman	1 No.	750/-
(b) Skilled Moulder	5 Nos.	1,250/-
(c) Semi skilled Moulder	5 Nos.	1,000/-
(d) Unskilled worker	10 „	1,250/-
(e) Store Keeper/clerk	1 No.	300/-
(f) Watchman	2 Nos.	300/-
(g) Peon	1 No.	150/-
		<u>5,000/-</u>

X. Other expenses (per month)

1. Rent	1,000/-
2. Electricity	300/-
3. Consumable Tools	100/-
4. Maintenance	350/-
5. Cartage & Freight	600/-
6. Publicity	100/-
7. Selling expenses	250/-
8. Stationery	50/-
9. Postage & Telephone	100/-
10. Miscellaneous expenses	150/-
	<u>3,000/-</u>

XI. Working Capital required (Per month)

1. Raw materials	49,000/-
2. Staff & Labour	5,000/-
3. Other expenses	3,000/-
	<u>57,000/-</u>

XII. Total Capital Investment

1. Machinery & equipment	79,000/-
2. Working Capital for 3 months	171,000/-
	<u>250,000/-</u>

XIII. Cost of Production (Per annum)

1. Raw Material	5,88,000/-
2. Staff & Labour	60,000/-
3. Other expenses	36,000/-
4. Interest on Capital @ 15%	37,500/-
5. Depreciation on Machinery @ 10%	7,900/-
	<u>7,29,400/-</u>

XIV. Total Sale (Per annum)

By sale of C.I. Castings in the form of Metric Weights 600 M.T. @1325/- per ton	7,95,000/-
Value of foundry return scrap 500 Kg. @650/- per ton	325/-
	<u>7,95,325/-</u>

XV. Profitability (Per annum)

Total Sale—Costs of Production=Profit
Profit=7,95,325—7,29,400 =65,925/-

(a) Percentage of Profit on Sale $\frac{65,925/-}{7,95,325} \times 100$
= 8%

(b) Percentage of return over Investment $\frac{65,925}{2,50,000} \times 100$
=26%

XVI. ANALYSIS OF BREAK EVEN POINT

Head of Expenses per month	Fixed Cost	Variable Cost	Total Cost
Raw Material		49,000	49,000
Staff & Labour	1500	3,500	35,000
Other Expenses	100	2,000	3,000
Depreciation	915	..	915
Interest on fixed cost	987		987
Interest on working capital		2,138	2,138
	4,402	56,638	61,040

B.E.P. $\frac{\text{Annual Fixed Cost} \times 100}{(\text{Annual Fixed Cost} + \text{Annual Profit})}$
= $\frac{4402 \times 100}{(4402 + 65925)}$
= 44 %

XVII. Suppliers of Plant and Machinery

Furnace

1. India Furnace Co.,
27B, Camac St. Benoy Bhāban, Calcutta.
2. The Wesman Engg. Co. (P) Ltd.,
1/2, Allenby Road, Calcutta-20.
3. G/W.R. Company,
89, A, Ballygunj Place, Calcutta-19.
4. Cieco (P) Ltd.,
18, Lawdon Street, Calcutta-17.
5. Pioneer Equipment Co. (P) Ltd.,
Old Padra Road, Baroda.
Gujarat.

Other Machinery.

1. Batliboi & Co. (P) Ltd.,
26, R.N. Mukerjee Road, Calcutta-1.
2. Union Tools & Agencies (P) Ltd.,
1, Chandni Chowk Street,
(on G.C. Avenue), Calcutta-13.
3. Power Tools & Appliances,
Dalhousie Sq. East. Calcutta-1.
4. Maneklal & Sons,
23, G.C. Avenue, Calcutta-13.
(Reserved item Sl. No. 351).

I. Product and its uses

The lashing chain is used in railway's open type wagon to fasten the stores/goods with the wagon body firmly—as the goods do not fall or thrown out while the wagon is in motion. It is made of steel link, turn buckle, handle staple plate, shackle nut and hook—This is a most important item for BR, MBW, BWH and BWL type wagons.

II. Market Potential

This item is required repeated replacement due to frequent uses irregular handling, further for building of new wagons. The railway is only one of major transport media in the country. As such there is scope for establishment of small scale units considering the increasing demand of expert market for Railway Wagon.

III. Production Target

Production target is fixed at 7800 per annum on the basis of single shift working and on an average 25 working days per month.

IV. Product details and process of manufacture

The lashing chain with hook is made from mild steel bar, MS forged nut, MS forged hook, Screw coupling of class IV steel forged staple plate.

The M.S. bar is first cut to size of each link length, then it is heated and press it to power press for bending and forming and links are joined with each other. Then joint of link are welded together.

The shackle, nut, screw, handle, hook are forged and after performing their machining operation it is assembled at stages with each other to make a complete lashing chain with hook and finished by painting.

V. Inspection and quality control

Since the lashing chain with hook has got several components to be assembled together it is advisable to check them at every stage of production.

Uses of various types of measuring instruments, gauges are necessary for the purposes.

The chains are tested in Hydraulic tensile testing machines such as for braking load upto 10.4 tons, proof load 3.6 tons and safe load of 1.5 tons as specified by the Railway Standard.

Economics of the Scheme

VI. Land and Building

Work Shed 4000 Sq.	Rs.
Ft. Rented P.M.	2,500

VII. Machinery Eqpt.

1. Centre lathe 6-6" 10" crs. ht. complete with H.P. motor & electrical and standard accessories	3 Nos.	40,000
2. Pillar Drill m/c. 2" Cap with 2 H.P. motor starter etc.	2 Nos	8,000
3. Shaping m/c 24" stroke with 3H.P. motor	1 No.	12,000
4. Arc Welding Generator 400 amp. (2 KVA) complete with Cable holder etc.	2 Nos.	40,000
5. Arc Welding Transformer 350 amp. (10 K.V.A.) complete with accessories	1 No.	6,000
6. Heavy Duty Ball Press 16 No size	2 Nos.	8,000
7. Power Rod flat cutting m/c. upto 25 mm dia with 3 H.P. motor	1 No.	8,000
8. Power Press 60 ton cap. with 10 H.P. motors	1 No.	20,000
9. Universal Milling machine no. 2 size 10" x 40" table with 3 H.P. motor & Standard accessories	1 No.	25,000
10. Pneumatic Hammer 250 kg cap with 25 H.P. motor etc.	1 No.	1,70,000

11.	Open/Closed different set of Dies	L.S.	Rs. 16,000
12.	Hydraulic Chain Testing M/c 30 ton cap.	1 No.	20,000
13.	Blacksmithy furnace with one-one H.P. motor with pipe line etc.	2 Nos.	6,000
14.	Hardness Testing machine	1 No.	8,000
15.	Gen. Engg. Blacksmithy testing instruments, gauges etc.	L.S.	20,000
16.	Bench Grinding	2 Nos.	2,500
17.	Semi-automatic cap. 7 ton m/c with H.P. motor		8,000

Utilities

Installation	20,000
Electrification & Water Transformer 100 K.V.A.	40,000
	<u>4,77,500</u>

VIII. Raw material P.M.

MS Rounds/Class IV Type of 1 R.S.—20—38mm—28 @Rs. 2,600/- mt.	Steel mt. 72,800
M.S. Billet 2", 3" Sq.—3.5 @ Rs. 2,200/- mt.	7,400
	<u>80,200</u>

IX. Staff and Labour p.m.

Works Manager	1 No.	1,000
Supervisors	2 Nos.	1,400
Skilled Workers	8 Nos. @400	3,200
Semi-skilled workers	10 Nos. @350	3,500
Tech. Labour	8 Nos. @250	2,000
Store Keeper/Clerk	2 Nos. @250	500
Accountant	1 No.	500
Sales-man	1 No.	600
Watch-man	2 Nos.	500
		<u>13,200</u>
Cost of labour benefits 10 %		1,320
		<u>14,520</u>

X. Other Expenses

1. Rent	Rs. 2,500
2. Electricity	2,500
3. Coal 5 mt.	800
4. Electrode 100 pkt.	6,500
5. Hot Die Steel 20 Kgs.	500
6. M/c. maintenance	1,000
7. Consumable Stores	2,500
8. Office Expenses	1,500
9. Transport & Freight	2,500
10. Packing Cost	1,200
11. Publicity	1,400
	<u>22,900</u>

XI. Working Capital Required (P.M.)

1. Raw material	80,200
2. Staff & Labour	14,520
3. Other Expenses	22,900
	<u>1,17,620</u>

XII. Total Capital Investment

1. Machinery & Equipment	4,77,500
2. Working Capital for 3 months	3,52,860
	<u>8,30,460</u>

XIII. Cost of Production (per annum)

1. Raw material	9,62,400
2. Staff & Labour	1,74,240
3. Other Expenses	2,74,800
4. Int. on cap investment @10 % p.a.	1,24,500
5. Dep. on m/c. & equipment @ 10 % p.a.	45,960
	<u>15,81,900</u>

XIV. Total Sale (P.M.)

1. By sale of 7800 Nos. Lashing chain with hook having 30 links (size of each link 167×65mm OD) @Rs. 250 each	19,50,000
2. By sale of Scrap	500
	<u>19,50,500</u>

XV. Profitability (per annum)

Total Sale—cost of production=Profit.

Profit=19,50,500—15,81,900—3,68,600
3,68,600=100

(a) % of profit on sale = $\frac{3,68,600}{19,50,000} \times 100 = 19\% \text{ approx.}$

(b) % of return on investment = $\frac{3,68,600 \times 100}{8,30,000} = 44\% \text{ approx.}$

XVI. Break Even Analysis

B.E.P. = $\frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Fixed Cost} + \text{Annual Profit}}$

Fixed Cost (per annum)

1. Rent	30,000
2. Interest	1,24,500
3. Depreciation on m/c. & equipt.	46,000
4. 40 % of salary	69,700
5. 40 % of other expenses (excluding rent)	98,000
	3,68,200

B.E.P. = $\frac{3,68,200 \times 100}{3,68,200 + 3,68,600} = 50\% \text{ approx.}$

XVII. Names and Addresses of the Machinery Suppliers.

1. M/s. Machine Tool Trade Impex
75, Ganesh Chandra Avenue
Calcutta-13.
2. M/s. Machinery & Spares,
133, Canning St.,
Calcutta-1.
3. M/s. Indian Furnace,
27A, Camac St.,
Calcutta-16.
4. M/s. Alfred Hertbert,
13/3, Strand Road,
Calcutta-1.

I. Product and its uses

Chain wheel and crank set is one of the important bicycle components. It is a toothed wheel fixed to a crank, which is pedalled by the bicycle rider for the propulsion of bicycle. As the bicycles are in big demand its major components also have good demand in the export market as well as in the home market. The item has very good demand as original as well as in the replacement market.

II. Production Target

It is proposed to manufacture 15,000 chain wheel and crank sets per month.

III. Production details and Process of manufacture

One set of chain wheel and crank consists of one chain wheel and two cranks viz. right hand and left hand. The manufacturing process is as follows:—

(a) Chain Wheel

1. Cutting of Chain wheel bank.
2. Piercing of centre hole.
3. Polishing.
4. Forming.
5. Design punching.
6. Cutting of teeth.
7. Straightening.
8. Electroplating.

(b) Cranks

1. Forged blanks are purchased from the forging units.
2. Turning of the boss (R.H. only)
3. Knurling/serations by punching of the boss (R.H. only).
4. Drilling and reaming of B.B. Axle Hole.
5. Drilling of Pedal Axle Hole.
6. Drilling and reaming cotter pin hole.
7. Threading Pedal holes.
8. Electroplating.

(c) Assembly

1. Riveting chain wheel with R.H. Crank.
2. Final reaming of B.B. Axle hole.
3. Testing.

IV. Inspection and Quality Control

I.S.I. has prescribed standard specifications and tests for this product vide their publication. No IS: 1281-1958. The same may be followed for carrying out the quality control and inspection. In process stage inspection should be carried out with the help of 'Go' and 'Not Go' plug gauges.

V. Land and Building

Land 500 sq. -Meter.	Rs.
Covered Area 250 sq. meter rented	1,250

VI. Machinery and Equipments

1. Power Press, Pillar Type, C.I. Body 150 tonne with 15 H.P. Electric Motor and Starter 1 No. 45,000
2. Power Press, Pillar type C.I. Body 100 tonne capacity with 10 H.P. Electric Motor and Starter 1 No. 30,000
3. Power Press, Pillar type C.I. Body 75 tonne capacity with 7.5 H.P. Electric Motor & Starter 2 Nos. 35,000
4. Power Press inclinesale type C.I. Body 10 tonne capacity with 2 H.P. electric motor and starter 1 No. 5,500
5. Double spindle drilling machine automatic 10 to 20 mm capacity with 5 H.P. electric motors and starters 3 Nos. 45,000
6. Special Purpose Crank Truning machines with 2 H.P. electric motor and starter 2 Nos. 10,000
7. Double spindle tapping machine with 2 H.P. electric motor & starter 1 No. 5,000
8. Double ended grinder 12" wheel 3 H.P. 1 No. 4,000

6	Rotary rivetting machine with 2 H. P. electric motor and starter	1 No.	Rs. 4,000/-
10	One double spindle reaming with 2.0 H. P. electric machine motor and starter	1 No.	5,000/-
11	Double ended polishers 3 H.P.	8 Nos.	24,000/-
12	Bench grinder 10", 0.75 H.P.	1 No.	1,400/-
13	Lathe 200mm bed 1.75 mm centre height wih complete accessories with 3 H.P. electric motor & starter	1 No.	12,000/-
14	Electroplating plant including electric installation	L. S.	41,000/-
15	Tools, gauges ingtruments jig, fixtures and dies	L. S.	20,000/-
16	Erection and installation charges	L. S.	18,500/-
17	Office furniture & equipments	L. S.	5,000/-
			<u>3,10,400/-</u>
	Say :		<u>3,10,500/-</u>

VI I. Raw Material Require-ments (per Month)

1.	M. S. Strip 200 mm × 10,11 G.—12.6 M. Tonne@Rs. 4,000/-	50,400/-
2.	Crank Forgings 15750 (sets) @Rs. 4.00 pairs.	63,000/-
3.	Nickle anode and electroplating chemicals.	10,000/-
		<u>1,23,400/-</u>
	Say :	<u>1,24,000/-</u>

VIII. Staff and Labour per Month

1.	Foreman	1	800/-
2.	Supervisor	1	600/-
3.	Skilled workers	22	8,800/-
4.	Semi-skilled	6	1500/-
5.	Un-skilled	6	1200/-
6.	Foreman Electroplating shop	1	600/-
7.	Manager	1	800/-
8.	Accountant-cum clerk	1	400/-
9.	Chowkidar	1	200/-
10.	Sweeper part-time	1	50/-
			<u>14,950/-</u>
	Say :		<u>15,500/-</u>

Other Expenses per month

1.	Electricity & water expenses	1250/-
2.	Oil and Lubricants	1000/-
3.	Consumable tools	700/-
4.	Stationery and postage	500/-
5.	Transportation	625/-
6.	Packaging	4000/-
7.	Rent	1250/-
8.	Emery power, grinding wheels, etc.	2000/-
9.	Un-foreseen expenses	1000/-
		<u>12,325/-</u>
	Say :	<u>12,500/-</u>

X. Working Capital required (for 3 months)

1.	Raw materials	124,000 × 3 = 3,72,000/-
2.	Staff & Labour	15,000 × 3 = 45,000/-
3.	Other expenses	12,500 × 3 = 37,500/-
		<u>4,54,500/-</u>

XI. Total Capital Investment

1.	Total Fixed Investment on machinery and equipments	3,10,500/-
	Working Capital for 3 months,	4,54,500/-
		<u>7,65,000/-</u>

XII. Cost of production (per annum)

1.	Recurring expenses = 4,54,500 × 4 =	18,18,000/-
2.	Interest on capital investment @15%	1,14,750/-
3.	Depreciation on Machinery & Equipment @10%	31,050/-
4.	Sales Expenses L.S.	36,000/-
		<u>19,99,800/-</u>
	Say :	<u>20,00,000/-</u>

XIII. Sales Proceeds (per annum)

1.	By sale of 1,80,000 sets of chain wheel & Crank @Rs. 12.60 per set	22,68,000/-
2.	By sale of scrap 18 tonne @ 1000,- per ton.	18,000/-
		<u>22,86,000/-</u>

XIV. Profitability (per annum)

Profit = Total sales — Cost of production
= 22,86,000 — 22,00,000 = Rs. 2,86,000/-

Percentage of profit on sales 12.50%

Percentage of return on investment 37.80%

XV. Break Even Analysis

Annual fixed cost

Annual fixed cost plus profit.

Fixed cost (per annum)	Rs.
1. Rent.	15,000/-
2. Interest on capital	1,14,750/-
3. Depreciation	31,050/-
4. 40% of salaries	72,000/-
5. 40% of other expenses	60,000/-
	2,92,800/-
Say Rs.	2,93,000/-

$$\begin{aligned} \text{B.E.P.} &= \frac{2,93,000 \times 100}{2,93,000 + 2,86,000} \\ &= \frac{2,93,000}{5,79,000} \times 100 = 50.6\% \text{ Approx.} \end{aligned}$$

XVI. Names and Addresses of Suppliers of Machinery and Equipment.

1. M/s Mankoo Industries,
678-Industrial Area 'B', Ludhiana.
2. M/s Perfect Machine Tools Co. (P) Ltd.,
Bell Building, Sir P. M. Road, Bombay.
3. M/s. Batliboi and Co. Pvt. Ltd.,
190-A, Forbes Street
Bombay.
4. M/s. New Era Industries,
Ferozepur Road,
Near Punjab Agricultural University,
Ludhiana.
5. M/s Hind Rectifiers Ltd.,
Mahalaxmi Chambers,
Bhulabhai Desai Road,
Bombay-400 026.
6. M/s Toshniwal Brothers,
Jhandewala Extension,
New Delhi.

(Reserved item Sl. Nos. 694 and 699)

* * *

I. Product and its uses

The product hardly needs any introduction as it is quite common amongst bicycle users. It is mainly used to cover the chain wheel and it protects the bicycle rider's trousers being caught by the chain wheel. However, it is an accessory of bicycle but it has much more importance. The demand is ever growing with the increase in demand of bicycles. The item has, therefore, very good potential.

II. Production target

It is proposed to manufacture 6000 dozens per month.

III. Production details and process of manufacture

It is quite a simple product to manufacture. The material required viz. CRCA Sheet 22 or 24 gauge. The sheets are cut to the required size strips by guillotine Shearing Machine, then it is formed to the required shape on the Power Presses. Finally, it is store enamelled and baked. Clips, Screws and nuts are purchased from outside and the assembly is completed.

IV. Inspection and quality control

There are no ISI Specifications on this product.

V. Land and Buildings

Rs.

Land 1000 sq. Metres.

Covered Area 300 sq.

Metres.

Rented. 1500 00

VI. Machinery and Equipments

1. Power Press, Pillen type, C. I. Body 50 tonnes capacity complete with 5 HP Motor & Starter.	1	15,000 00
2. Power Press, Pillen type, C. I. Body 20 tonnes cap. complete with 3 HP Motor & Starter.	1	8,000 00
3. Power Press inclinable type, C. I. Body, 5 tonnes cap. complete with 2 HP Motor & Starter.	2	7,000 00

4. Five stage transfer Press 10 tonnes complete with 2 HP motor & Starters.	2	20,000 00
5. Guillotine Shearing Machine 1000 mm x 3 mm cap. complete with 2 HP Motor & Starter.	1	10,000 00
6. Power Press, Inclinable type 3 tonnes capacity. C. I. Body complete with 1 HP Motor & Starter.	2	5,000 00
7. Special Purpose Roller Turning Machine, complete with 1 HP Motor and Starter.	1	2,500 00
8. Lathe 1800 mm bed, 150 mm Centre height complete with 3 HP Motor & Starter.	1	14,000 00
9. Shaping Machine 750 mm stroke complete with 3 HP Motor & Starter.	1	14,000 00
10. Complete stove enamelling plant including baking oven.	1	10,000 00
11. Installation & Electrification charges.	L.S.	11,000 00
12. Office furniture & equipments.		5,500 00
13. Tools, dies, fixtures etc.	L.S.	10,000 00
Total fixed Investment		1,32,000 00

VII. Raw Material Requirement (Per Month)

1. 22 or 24 Gauge CRCA Sheet/Strip 16.5 m. Tonnes @Rs. 5000/- per tonne.	82,500 00
2. Clips, Screws & Nuts—500 Gross @Rs. 10/- per gross.	5000 00
3. Enamell.—1200 Litres @Rs. 12/-.	14,400 00
	1,01,900 00

Say : Rs. 1,02,000 00/-

VIII. Staff and Labour (Per Month)

		Rs.
1. Manager.	1	900·00
2. Accountant-cum-clerk.	1	400·00
3. Chowkidar.	1	200·00
4. Peon.	1	200·00
5. Foreman.	1	700·00
6. Skilled workers.	10	3000·00
7. Semi-skilled workers	3	750·00
8. Un-skilled workers.	3	600·00
9. Painter	1	600·00
10. Helpers.	@Rs. 200/- 3	600·00
		7950·00
Say Rs.		8000·00

IX. Other Expenses (Per Month)

	Rs.
1. Electricity & water expenses.	500·00
2. Consumables i.e. oils & lubricants.	500·00
3. Coal & Fire Wood—10 tonnes.	4500·00
4. Tools & Dies.	2000·00
5. Postage & stationery.	300·00
6. Rent.	1500·00
7. Cartage & freight.	400·00
8. Misc. expenses.	400·00
9. Packaging expenses.	9000·00
Total Rs.	19100·00

X. Working Capital Required (For three Months)

1. Raw Material $1,02,000 \times 3$	3,06,000/-
2. Salaries & wages, $8,000 \times 3$	24,000/-
3. Other Expenses $19,100 \times 3$	57,300/-
	<u>3,87,300/-</u>

XI. Total Capital Investment

1. Total fixed investment on machinery & equipment	1,32,000/-
2. Working capital for three months.	3,87,300/-
	<u>5,19,300/-</u>
Say Rs.	5,20,000/-

XII. Cost of Production (Per Month)

	Rs.
1. Recurring Expenses $3,87,300 \times 4\%$	15,49,200
2. Interest on capital investment @15%	77,900
3. Depreciation on machinery & equipment @10%	13,200
4. Sales Expenses	10,000
	<u>16,50,300</u>
Say Rs.	16,51,000

XIII. Sale Proceeds (Per Annum)

By sale of 72,000 doz.	18,00,000/-
Chain cover @Rs. 25.00 per dozen.	54,000/-
By sale of scrap.	

18 4,000

XIV. Profitability (Per Annum)

$$\begin{aligned}\text{Profit} &= \text{Total sales} - \text{cost of production} \\ &= 18,54,000/- - 16,51,000/- \\ &= 2,03,000/-\end{aligned}$$

(a) Percentage of profit on sales—

$$\frac{2,03,000}{18,54,000} \times 100 = 10.9\% \text{ approx.}$$

(b) Percentage of return on investment

$$\frac{2,03,000}{5,19,300} \times 100 = 39.09\%$$

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed Cost}}{\text{Annual Fixed Cost} + \text{Profit}} \times 100$$

Fixed Cost (Per Annum)

	Rs.
1. Rent.	18,000/-
2. Interest.	77,900/-
3. Depreciation.	13,200/-
4. 40% salaries.	38,400/-
5. 10% other exp.	91,680/-
	<u>2,39,180/-</u>

Say : Rs. 2,39,200/-

$$\begin{aligned}\text{B.E.P.} &= \frac{2,39,200}{2,39,200 + 2,03,000} \\ &= \frac{2,39,200}{4,42,200} \times 100 = 54\% \text{ approx.}\end{aligned}$$

Names and Addresses of suppliers of Machinery and Equipment

1. M/s. Batliboi & Co. Pvt. Ltd.,
190-A, Forbes Street,
Bombay-400 001.
2. M/s. Perfect Machine Tools Co. (P) Ltd.
Bell Building, Sir P. M. Road,
Bombay -400 001.
3. M/s. Manko Industries,
678, Industrial Area-B,
Ludhiana.

4. M/s. Channay Furnace Co.
Janta Nagar, Bhagwan Chowk,
Ludhiana.

5. M/s. Burma Mechanical Works,
272, Industrial Area-A,
Ludhiana.

(Reserved item Sl. No. 696).

I. Product and its uses

Concrete mixer is an essential machine for mixing sand, gravel and cement in specified proportion for any civil construction work. Such machines are used by construction men for, heavy pilling, reinforcing, building and similar construction work.

II. Market Potential

In the country construction work is rapidly increasing keeping with the policy of the Government. New projects are coming up in different parts of the country demanding more utilities by the construction men. Apart from in-country demand, there is enough finds an ever increasing demand from construction men. Apart from in-country demand, there is enough scope for its export in the under developed or developing countries, in view of rapid progress in construction work in those countries.

III. Production Target

In the project it has been envisaged to produce 10 nos. of 10/7 cft. concrete mixer per month or 120 nos. per annum.

IV. Production details and process of manufacture:

The project envisages to procure all C.I. castings i.e. rotary drum, heavy gears, brackets, wheels etc. from reputed foundry. Entire fabrication work and the assembly will be done by the unit, keeping in view the requirement of customer. The mixer will be tilting type, hopper fed and driven by 5 H.P. diesel engine with cooling radiator. The mixer will be mounted on 4 wheeled trolley (fabricated). All small components i.e. shaft, bushes, small gears etc. will be machined in respective machines provided in the project.

V. Inspection and quality control

Adequate care and check is necessary to ensure supply of right type of raw material and purchased components. In the plant proper check is necessary for fabrication and machining of components. For which necessary inspection tools and gauges are to be provided. After assembly and mounting the drum, the machine is tested by driving to check the balance of rotary drum and its general performance.

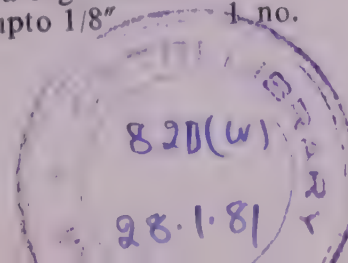
VI. Land and Building

250 sq. Meter Built up
cover for shed & office
approx. 50 sq.m.

Rented

VII. Plant and Machinery

		Rs.
1. 10 ft. S. S. & SC lathe with 5 H. P. motor and standard accessories & electricals.	1 no.	22,000·00
2. 6 ft. S. S. & SC lathe with 2 H. P. motor and standard accessories & electricals.	1 no.	15,000·00
3. Chuck Lathe 6 ft. Swing heavy duty with 10 H. P. motor & accessories.	1 no.	35,000·00
4. Universal milling machine no. 2 complete with standard accessories & electricals and dividing head, vertical attachment, circular table etc.	1 no.	45,000·00
5. Shaping machine 24" stroke with 3 H.P. motor & accessories	1 no.	18,000·00
6. Pillar drilling machine 1½" cap. with 2 H.P. motor & accessories	1 no.	6,000·00
7. Portable drill ½" capacity with stand.	1 no.	2,000·00
8. Pedestal type double ended tool grinder 10" wheel.	1 no.	3,000·00
9. Hacksaw machine 6"×6" capacity with electricals.	1 no.	3,000·00
10. High pressure gas welding & cutting torch with standard accessories.	1 set each	3,000·00
11. Transformer welding set 400 amps. with accessories.	1 no.	7,000·00
12. Hand shearing machine capacity upto 1/8"	1 no.	1,200·00



13. Smithy hearth with blower & 1 H.P. motor etc.	1 no.	2,500·00
14. Flexible shaft grinder with 6" wheel etc.	1 no.	2,000·00
15. Tool post grinding attachment for lathe	1 no.	2,500·00
16. Chain pulley block 3 ton capacity complete with chain	1 no.	1,500·00
17. Spray painting unit with compressor, paint gun & accessories	1 no.	3,000·00
	Rs.	1,72,700·00
18. Cost of installation & electrification @10% of m/c. cost		17,000·00
19. Cost of pattern measuring instrument, drums equipment, Jigs & fixtures etc.		15,000·00
20. Office furniture & equipment		5,000·00
21. Pre-operative expenses and contingencies		10,000·00
	Rs.	2,18,700·00

RECURRING EXPENDITURE:

VIII. Raw Material (Per Month)	Rs.
(a) C. I. casting @750 kg. per m/c. (average)—7·5 tons @2250 per ton	16,875·00
(b) M. S. Section (Channel, angle, flats, etc.) @750 kg. per machine (average)—7·5 tons @3000 per ton.	22,500·00
(c) Gun metal @Rs. 35/kg. per m/c. —40 kg.	1,400·00
(d) Diesel engine 5 H.P. with water cooled radiator and fittings @6000·00 per set—10 nos.	60,000·00
(e) Ball bearing of various sizes @6 nos. per machine—60 nos.	6,000·00
(f) Steel chain 1" pitch @20ft. per m/c. —200 ft.	6,000·00
(g) Nuts, bolts, spring, washers, cotters, spilt pins etc.—100 kg.	1,000·00
(h) Asbestos sheet, rubber sheets, oil seals, link belt for radiator etc.—10 sets each.	500·00
(i) Brease nipples 1/2" 10 doz.	200·00
(j) Steel wire rope 2" dia. @30 ft. per machine—300 ft.	600·00
(k) Clamps for wire rope, locks, lock lever etc.—10 sets.	300·00
	Rs. 1,15,375·00

IX. Staff and labour

		Rs.
(a) Works Manager @1000·00 p.m.	1 no.	1000·00
(b) Draftman Senior @500·00 p.m.	1 no.	500·00
(c) Shop Supervisor @400·00 p.m.	2 nos.	800·00
(d) Inspector @400·00 p.m.	1 no.	400·00
(e) Store keeper @350·00 p.m.	1 no.	350·00
(f) Accountant @350·00 p.m.	1 no.	350·00
(g) Sales Assistant @400·00 p.m.	1 no.	400·00
(h) Typist clerk @300·00 p.m.	1 no.	300·00
(i) Peon @200·00 p.m.	1 no.	200·00
(j) Watchman @200·00 p.m.	2 nos.	400·00
(k) Sweeper (Part-time) @50·00 p.m.	1 no.	50·00
(l) Skilled operator @300·00 p.m.	10 nos.	3000·00
(m) Semi skilled operator @250·00 p.m.	6 nos.	1500·00
(n) Labour @200·00 p.m.	4 nos.	800·00
		10,050·00

Cost of labour benefit @10% 1,000·00

Rs. 11,050·00

X. Other expenses (per month)

	Rs.
(1) Rent	1,000·00
(2) Electricity	400·00
(3) Consumable tools, welding materials etc.	2,000·00
(4) Packing & forwarding	750·00
(5) Cartage & freight	500·00
(6) Maintenance	500·00
(7) Other consumable oil, lubricants etc.	200·00
(8) Publicity	500·00
(9) Sales expenses including travelling	500·00
(10) Stationery, postage, insurance etc.	250·00
	Rs. 6,600·00

XI. Working Capital Required (Per Month)

	Rs.
(1) Raw material	1,15,375·00
(2) Staff & labour	11,050·00
(3) Other expenses	6,600·00
	Rs. 1,33,025·00
Say Rs.	1,33,000·00

XII. Total Capital Investment

(a) Non-recurring expenditure	2,18,700·00
(b) Recurring expenditure × 3 months i.e. 133000 × 3	3,99,000·00
Rs.	6,17,700·00

XIII. Cost of Production (Per Annum)

(1) Raw material	13,84,500·00
(2) Staff & labour	1,32,600·00
(3) Other expenses	79,200·00
(4) Interest on capital @15%	92,650·00
(5) Depreciation on m/c. @10%	21,870·00
Rs.	17,10,820·00
Say Rs.	17,10,800·00

XIV. Total Sale (Per Annum)

By sale of 120 nos, of concrete mixer @Rs. 15800·00 each (average) [19,00,000·00 Approx.

XV. Profitability (Per Annum)

	Rs.
Total sale	19,00,000·00
Cost of Production	17,10,800·00
Profit	1,89,200·00

(a) Percentage of Profit on sale
$$= \frac{189200 \times 100}{1900000} = 10\% \text{ approx.}$$

(b) Percentage of return on capital

$$= \frac{189200 \times 100}{617700} = 30\% \text{ approx.}$$

XVI. Break Even Analysis

$$\text{B. E. P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{Annual Profit.}}$$

Annual fixed cost :

1. Rent	12,000·00
2. Interest	92,650·00
3. Depreciation on machinery	21,870·00
4. 40% of salary	53,040·00
5. 40% of other expenses	31,680·00

$$\text{B. E. P.} = \frac{211240 \times 100}{211240 + 189200} = 52\% \text{ approx.}$$

XVII. Suppliers of Machinery:

1. M/s. Batliboi & Co., Jiwanvihar, Parliament St., New Delhi.
2. M/s. Perfect Machine Tools, Bell Buildings, Ballard Estate, Fort, Bombay.
- (3) M/s. Indian Oxygen Co. Ltd., P-34, Taratala Rd., Cal-53.
- (4) M/s. Voltas Ltd., 8, N.S. Road, Calcutta-1

(Reserved item Sl. No. 514).

I. Products and their uses

For cooking and serving, various cutleries are required and used. With change of time and modes of living, variance of taste and requirement, manufacturers of cutleries are required to switch over their production items from old types to new types. Production in small scale and with general purpose machinery, however, are not affected much with this change. So it is advisable to produce this item with general purpose machinery. The cutlery items are reserved for production exclusively in the small scale sector.

II. Market Potential

Growth of urbanisation and braking up of joint families have given a boost to the demand of light metal cutleries with shining appearance. Various types of knives such as Butter Knives, Vegetable Knives, Fruit Knives and service spoons are in great demand both in rural and urban markets. Considering the growth of population it may safely be presumed that the demand will go on increasing. So selling of goods by small scale units will not pose any problem.

III. Production Target

The profile has been estimated on production and sales of 1200 dozens of Ladle type service spons, 5000 dozens of table knives and 2500 dozens of butter spreaders.

IV. Production details and process of manufacture

For the production of cutlery, raw materials are cast or forged or pressed from sheet metal. This profile has been worked out on the basis of pressing sheet metal articles inside the workshop and cast blanks purchased from outside.

The rough blanks are then ground in offhand grinding and then polished and buffed. For grinding as well as polishing generally, the grit size is increased by about 40 nos. for each operation.

For knives, most economical operation is to purchase worn out files from scrap market and then reshape them by hot forging. Where adequate supply of such files are not available, rectangular sections of carbon or stainless steels whichever is to be made, is to be purchased.

V. Quality Control and Standards

For following proper practice, the following I.S.I. Specifications will be helpful :

1. IS:990—Spoons, stainless steel
2. IS:994—Butter knives and fish knives
3. IS:995—Table knives, Dessert knives and Fruit knives
5. IS:3545—Vegetable knives

VI. Land and Building

	Rs.
80 Square metre covered area to be rented @Rs. 5/- per square metre per month	400.00

VII. Machinery and Equipment

	Rs.
(1) Treadle Guillotine Shearing Machine	5,000.00
(2) 50 Ton Capacity Open back Inclinable Power Press	50,000.00
(3) Heavy duty Pillar Press 300 mm between pillars	3,000.00
(4) Buffing/Polishing M/c 4 Nos.	4,000.00
(5) Double ended Grinder 2 Nos.	2,500.00
(6) Bench Drill Machine—1/2" Capacity	2,500.00
(7) Work Bench, Hand tools etc.	4,000.00
(8) Press Tools	5,000.00
(9) Furnitures and office equipment	4,000.00
(10) Installation, electrification	7,000.00
	Rs. 86,000.00

VIII. Salaries and Wages (Per Month)

	Rs.
(1) Supervisor	800.00
(2) Skilled workers 2 Nos.	800.00
(3) Semi-skilled workers 4 Nos.	1,000.00
(4) Unskilled workers 2 Nos.	400.00
(5) Storekeeper cum Clerk	500.00
(6) Watchman cum Peon	200.00
(7) Labour amenities	700.00
	Rs. 4,400.00

IX. Raw Materials (Per Month)

Rs.

Stainless Steel Sheets 250 kg. @Rs. 56 per kg.	14,000·00
(2) Handles and Sundries	1,000·00
Total	15,000·00

X. Other Expenses (Per Month)

Rs.

(1) Rent	400·00
(2) Power	200·00
(3) Consumable items	400·00
(4) Maintenance and Small tools	400·00
(5) Packing, Transport and Conveyance	500·00
(6) Contingencies	200·00
Total	2,100·00

XI. Working Capital (3 months' expenses)

Rs.

(1) Salaries & Wages	13,200·00
(2) Raw materials	45,000·00
(3) Other expenses	[6,300·00]
Total	64,500·00

XII. Capital Investment

Rs.

Fixed	86,000·00
Working	64,500·00
Total	1,50,500·00

XIII. Cost of Production (Annual)

Rs.

(1) Salaries and Wages	52,800·00
(2) Raw Materials	1,80,000·00
(3) Other expenses	25,2000·00
(4) Depreciation of m/c @10% per annum	8,600·00
(5) Interest on Capital Invest- ment @15% per annum	22,575·00
Total	2,89,175·00

XIV. Sales Proceeds (Annual)

Rs.

(1) 1200 dozens of Spoons (Serving) @Rs. 4·5 each	64,800·00
(2) 5000 dozens of Table Knives@ Rs. 3·00 each	1,80,000·00
(3) 2500 dozens of Butter Sprea- ders @3·5 each	1,05,000·00
Total	3,49,800·00

XV. Profitability (Before charging Taxes)

$$\text{Profit} = \text{XIV} - \text{XIII} = \text{Rs.}(349800 - 289175) \\ = \text{Rs.} 60625$$

The profit is 17% of sales and 40% of capital investment.

XVI. Break Even Analysis

Rs.

(1) Depreciation of machinery	8,600·00
(2) Interest on Capital Investment	22,575·00
(3) Rent	4,800·00
(4) 40% of Salaries and wages	21,120·00
(5) 40% of other expenses	8,160·00
Total	65,255·00

$$\text{Break Even Point} = \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\ = \frac{65255 \times 100}{65255 + 60625} \\ = 51·8\%$$

XVII. Sources of Machinery

- (1) Surensens P. Ltd. 3A Raja Kalikissen Lane, Calcutta-700005.
- (2) Maneklal & Sons, 115/116 Narayan Dhuru Street, Bombay-400003.
- (3) Atlas Works, 119 Ripon Street, Calcutta-700 016
- (4) Raj Industries, Millergunj, G T. Road, Ludhiana-140 003

(Reserved item Sl. No 472)

I. Product and its uses

(a) Cycle spokes, nipples and washers are important parts for the manufacture of bicycle and such unit is ancillary to bicycle industry. These products have replacement market also.

(b) market potential

Due to increase in population, there is growing need of bicycles. As such there is possibility of increase in demand of spares from cycle manufacturing industries. Since this item is also under tension, it requires replacements and as such there is good demand from cycle repairers.

There is good demand from not only under developed countries but also from developed countries. We are exporting bicycle spares to United States, Germany and other countries.

II. Production targets

It is proposed to manufacture 5000 gross of cycle spokes, nipples and washers per month.

III. Production details and process of manufacture

Bicycle spokes are manufactured on automatic machines. On these automatic machines, G.I. wire of requisite diameter is fed from the roll directly. The following operations are carried out—

- Cutting to sizes.
- Heading.
- Bending.
- Threading.

For manufacture of nipples—first the nipples are formed on a header from brass rod of specific diameter. These formed nipples are fed on an automatic machine where drilling, tapping and sizing operations are carried out. In the scheme, it is proposed to purchase washers from outside.

IV. Inspection and quality control

Bicycle spokes are to be manufactured from G.I. wire which has a specific quality to withstand the bending test. The first important thing is to test the G.I. wire to ensure that it withstands the bending test as specified in IS specification No. 630: 1965. Spokes, nipples and washers should be tested as per the following standard—

IS:630-1961—Specification for bicycle spokes (Plane) and Nipple for spokes.

V. Land and Building

	Rs.
Covered area 150 sq. metres per month.	Rented. 750·00

VI. Machinery and equipment

(1) Special machine for spoke making	1 No.	Rs.3,50,000·00
(2) Header for nipple	1 No.	
(3) Special machine for nipple machining	3 Nos.	
(4) Bench grinder 8" dia.	1 No.	1,000·00
(5) Measuring instruments		1,000·00
(6) Installation and erection charges		10,000·00
(7) Office furniture and equipments		1,000·00
Total		3,63,000·00

VII. Raw Material Requirement (Per Month)

	Rs.
(1) Brass wire 3·78 mm dia. 878 Kgs. @Rs. 30/- per Kg.	26,340·00
(2) Galvanised steel wire of 1·8 and 2 mm dia, 7 tons @ Rs. 6000/- per ton.	42,000·00
(3) Washer, 5000 gross @ 30 paise per gross	1,500·00
Total	69,840·00

VIII. Staff and Labour (Per Month)

	Rs.
(1) Manager	1 No. 800·00
(2) Skilled Worker	1 No. 400·00
(3) Semi-skilled Worker	1 No. 300·00
(4) Unskilled Worker	1 No. 200·00
(5) Watchman	1 No. 200·00
(6) Cost of Labour benefit	200·00
Total	2,100·00

IX. Other Expenses (Per Month)

	Rs.
(1) Rent	750·00
(2) Electricity & Water	300·00
(3) Oil & Lubricants	100·00
(4) Consumable tools	200·00
(5) Maintenance	100·00
(6) Cartage & freight	100·00
(7) Publicity expenses	100·00
(8) Packing & Electricity	2,500·00
(9) Stationary & Postage	150·00
Total	4,300·00

X. Working Capital (Per Month)

	Rs.
(1) Raw Material	69,8440·00
(2) Staff & Labour	2,100·00
(3) Other Expenses	4,300·00
Total	76,240·00

XI. Total Capital Investment

	Rs.
(1) Machinery & Equipments	3,63,000·00
(2) Working Capital for 3 months	2,28,720·00
Total	5,91,720·00
Say Rs.	[5,92,000·00

XII. Cost of Production Per Annum

	Rs.
(1) Raw material	8,38,080·00
(2) Salaries	25,200·00
(3) Other Expenses	51,600·00
(4) Interest on capital @15%	90,000·00
(5) Depreciation on machinery @10%	36,300·00
Total	10,41,180·00
Say Rs.	10,42,000·00

XIII. Total Sales Per Annum

	Rs.
(a) Receipt by sale of 60,000 gross Spokes, Nipples & Washer @18·50 per gross	11,10,000·00

	Rs.
(b) Receipt by sale of brass scrap 3,512 Kgs. @25 per kg.	87,800·00
Total	11,97,800·00

XIV. Profitability (Per Month)

Total sale—Cost of production—profit
Rs. 11,97,800·00—10,42,000·00—1,55,800·00

(a) Percentage of profit on sale—

$$\frac{1,55,800 \times 10}{11,97,800} = 13\cdot7\%$$

(b) Percentage of return over investment.

$$\frac{1,55,800 \times 100}{5,92,000} = 26\%$$

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed Cost} \times 100}{(\text{Fixed cost} + \text{Profit.})}$$

Annual Fixed Cost	Rs.
(1) Rent	9,000·00
(2) Interest	90,000·00
(3) Depreciation on machinery and equipments	36,300·00
(4) 40% on salaries	10,080·00
(5) 40% on other expenses	1,74,400·00
Total Rs.	1,62,780·00
Say Rs.	1,63,000·00

$$\text{B.E.P.} = \frac{1,63,000 \times 100}{(1,63,000 + 1,55,800)} = 51\%$$

XVI. Name and address of machinery Suppliers

- (1) M/s Hindustan Monarch (P) Ltd., A-10, Industrial Area No. 3, Meerut Road, Ghaziabad (U.P.). Special auto-machines for spokes and nipples manufacturing.
- (2) M/s. Newalson Industries, 9, Esplanade Road, Delhi-110 006. —do—
- (Reserved item Sl. No. 720)

I. Introduction

A. Divider is a drawing instrument used by draughtsmen and engineers for transferring measurements and for marking of equal distances. It is also called as plain divider provided with detachable needles and with or without fine adjustment device.

Dividers of sizes 112 mm complete with needle and screws is generally used. In the drawing instrument set it is also one of the items either in the form of utility set or engineers' set of instruments. These are also designed as springs bow dividers and sector head dividers. This schemes envisages the manufacture of only plain dividers.

B. Market Potential: There is a good scope for the item as an individual plain dividers used by the engineers and drawing offices etc. Dividers are first wrapped in paper and then packed in a suitable carton and supplied. They may be also supplied as complete set in a suitable box.

II. Production Target

30,000 Nos. of engineers' plain dividers of assorted materials—value Rs. 2,24,000 per annum.

III. Production details and process of manufacture

The plain metal type engineers' drawing instrument dividers which is a part of the instrument set or otherwise used, is made of rolled, drawn or cast brass, nickel silver, or stainless steel provided with self centering devices of sizes 112 of 127 mm. The provision for fixing needle is made on both the legs and screw hole and screw arrangement are made for tightening the joints.

The self centering device is made of sheet brass and holding knob is made from brass, plated or nickel silver plated which is turned from bar stock. All the above 4 parts are assembled.

IV. Quality, Standards and specifications

IS No. 3206-1965 can be followed for product specification and quality control performance test etc.

The dividers made from brass are chromium plated to IS: 1068-1958.

Dividers made from Nickel Silver or Stainless steel are polished and buffed.

Needles are procured as per IS: 3126-1965.

Different screws used with the dividers are procured as per IS: 3222 (Part I).

V. Land and Building (Rented)

	Rs.
Covered area 150 sq. mts.	300/-

VI. Machinery & Equipment

(1) Bench type vertical milling m/c Table length 24" hand operated. Spindle head to accurate collet holder KALSI or CE-MOTEC or similar . 3 Nos.	Rs. 30,000.00
(2) High Provision Micro Drilling m/c. 3 mm dia cap. 66 Renit" or similar . one	5,500.00
(3) Hand Press No. 8 . . One	2,000.00
(4) Bench capstan lathe Ben cap 15 mm Deam or similar . . . One	20,000.00
(5) Buffing & Polishing m/c. 8" wheel . . . One	3,000.00
(6) Hand tools and measuring instruments . . .	5,000.00
(7) Work benches, tables, office equipment . . .	5,000.00
(8) Installation . . .	3,000.00

Total	74,500.00
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VII. Raw Materials & Consumable Stores

	Rs.
(1) Brass, cold rolled 5 mm square section . . . 200 Kg.	7,000·00
(2) Free cutting steel rods . . . 1	200·00
(3) Brass rivets 5 mds . . . 5 mds.	100·00
Total	7,300·00
(4) Needles for dividers . . .	100·00
(5) Consumable stores such as taps dies cutting tools, cotton waste polishing materials etc.	250·00
(6) Electroplating charges . . .	150·00
Total	7,800·00

VIII. Staff & Labour/Month

A. Administrative & Supervisory

	Rs.
(1) Manager cum supervisor . . . One	650·00
(2) Ministerial staff . . . One	400·00
(3) Peon One	200·00
(4) Chowkidar One	200·00
Total	1,450·00

B. Technical & Others

	Rs.
(1) Machine operators . . . 5 Nos.	2,000·00
(2) Fitter Two	400·00
(3) Helper One	200·00
(4) Packer One	200·00
(5) Staff welfare @30% . . .	1,275·00
Total	5,525·00

IX. Other Expenses

	Rs.
(1) Power & Water . . .	150·00
(2) Maintenance & repair . . .	100·00
(3) Printing, postage & stationery . . .	100·00
(4) Consumable stores including sub-contract forging work . . .	200·00
(5) Advertisement & publicity . . .	200·00
(6) Packing expenses . . .	200·00
Total	950·00

	Rs.
(7) Taxes	100·00
(8) Other expenses	200·00
(9) Transportation charges . . .	100·00
(10) Rent	300·00
Total	1,650·00

X. Working Capital Per month

	Rs.
(1) Raw material . . .	7,800·00
(2) Personnel . . .	5,525·00
(3) Other expenses . . .	1,650·00
Total . . .	14,975·00

XI. Capital investment

	Rs.
(1) Machinery & Equipment . . .	74,500·00
(2) Working capital for 3 months . . .	44,925·00
Total	1,19,425·00

XII. Cost of Production Month

	Rs.
(1) Recurring expenses . . .	14,975·00
(2) Insurance	100·00
(3) Depreciation on M/cs. @10% (say)	620·00
(4) Interest on capital investment @15% (say)	1,495·00
Total	17,185·00

XIII. Sales Proceeds

	Rs.
By sale of Engineers' dividers of brass, nickel silver & stainless steel 2500 Nos. per month @Rs. 8/- each	20,000·00

XIV. Profitability Per Month

$$\text{Profit} = \text{Sales} - \text{Cost of production} \\ = 20,000 - 17,185 = 2,815$$

$$\text{Percentage profit on sales} = \frac{2,815 \times 100}{20,000} = 14.07\%$$

$$\text{Percentage profit of return} = \frac{2,815 \times 12 \times 100}{1,19,425} = 28.3\%$$

XV. Break Even Point*Fixed Cost*

	Rs.
Rent	300· 00
Interest	1,495· 00
Insurance	100· 00
Depreciation	620· 00
40 % salaries	2,210· 00
40 % other expenses	680· 00
Total of XV	5,405· 00

$$\frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{profit}} = \frac{5405 \times 100}{8220} = 65.75\%$$

XVI. List of Machinery Suppliers

- (1) M/s. Perfect Machine Tools (P) Ltd., Bell Buildings, Sir P. M. Road, Fort, Bombay-1
- (2) M /s. Kalsi Engg. Works, Miller Ganj, Ludhiana.
- (3) M/s. Batliboi & Co., Parliament Street, New Delhi-1.

XVII. Source of Raw Materials

- (1) M/s. Bombay Metals & Alloys Mfg. Co. Ltd, Reay Road, Bombay.
- (2) M/s. Bandan Metals & Alloys, Mysore Road, Bangalore.
- (3) M/s. Kamani Metals & Alloys Ltd., Bombay.

(Reserved Item Sl. No. 736)

I. Product and its uses

(a) The sewing machine in question is a domestic item and it is used for day-to-day stitching of garments either at home or in the small tailoring houses. There are three models (1) hand operated, (2) foot operated, and (3) motor operated. Although there is a slight difference in the basic mechanism of these three machines but here we shall take up the hand-operated model of the sewing machine which is largely used in our homes.

(b) Market potential

It is now an established fact that the sewing machine has now become an essential part of every house-wife's life and therefore it is anticipated that the demand of the item would be ever increasing. Although there are certain standard manufacturers both in the large and medium scale manufacturing these machines like M/s. Jay Engineering Works, Calcutta; M/s. Sansar Sewing Machines, Delhi and so on, yet the item manufactured in the small scale sector has a good demand because of its low cost as compared to the prices of reputed manufacturers because of enormous overheads etc. The increase in the export of ready-made garments from India has also given a boost to the existing demand of sewing machines. As regards the export market it has been found that there is a great demand of the sewing machines manufactured in India in the Middle East and South East Asian countries and one can safely say that if an entrepreneurs starts making a quality product there would be no problem in the sales.

II. Production Targets

The scheme has been formulated for the production of 400 machines per month.

III. Products details and process of manufacture

Since the production targets are quite low, it is desired that most of the parts like C.I. castings for arm and bed plate, pressed components, wooden components like base and cover, other machine components and accessories like needles, screw drivers, bobbins etc. would be procured from the market mainly existing at Ludhiana. The C.I. castings would be machined in the unit, then they will be painted stoved and then sent to the Assembly Section where all the Parts would be assembled and fitted. The machine

would then be tested for its sewing capabilities and then despatched for sale.

IV. Inspection and quality control

Proper vigilance of the quality is very important in this type of unit since almost all the components have to be taken from different sources and therefore to maintain quality of the product it would be essential that they are critically examined at the in-coming stage.

V. Land and Building

Covered area 350 sq. metre	Rented	Rs.
		3,500.00

VI. Machinery/Equipment

Machine Shop

		Rs.
(1) Adda type Milling machine (vertical) Bed size	One	12,500.00
(2) Adda type Milling machine (Horizontal) Bed size 4	One	9,500.00
(3) Bench Drilling machine 1/2" cap. with tapping attachment	One	5,000.00
(4) Double ended Bench Grinder 8" wheel size	One	2,000.00
(5) Centre Lathe SS& SC 4-1/2 ft.	One	8,000.00

Paint Shop

		Rs.
(1) Air Compressor with 1 H.P. motor and spray gun	One	7,500.00
(2) Baking oven 5' x 4' x 4 Electrical	One	9,500.00
(3) Painting booth with exhaust fan 12"	One	2,000.00

Assembly Shop

(1) Potable Hand Drill	One	1,000.00
(2) Assembly benches	Four	2,000.00

Tools, jigs, fixtures, Milling cutter etc.	10,000·00
Inspection instruments, guages hardness tester etc.	10,000·00
Office equipment including type-writer, tables etc.	10,000·00
Erection and installation charges	5,000·00
Total cost of Machinery and Equipments	94,000·00

VII. Raw Material (Per Month)

	Rs.
(1) Bought out castings (Arm+Bed) 4·5 Kg. 4·5 Kg.= 9 Kg. per machine @ Rs. 3·5 per kg. for 400 machines.	12,000·00
(2) Bought out components @ Rs. 60/- per machine for 400 machines	24,000·00
(3) Cost of wooden base and cover @ Rs. 35/- per m/c. for 400 machines	14,000·00
(4) Accessories box @ Rs. 10/- per machine for 400 machines	4,000·00
(5) Cost of paint and varnish, transfer lables, packing material, like polythene bags etc. @ Rs. 12/- per machine for 400 machines	4,800·00
(6) Consumables	100·00
Total	59,500·00

VIII. Staff & Labour (Per Month)

		Rs.
(1) Manager-cum- Production Engineer	One	800·00
(2) Supervisor	One	600·00
(3) Inspector	One	500·00
(4) Clerk-cum- Accountant	One	400·00
(5) Skilled workers	Eight	3,200·00
(6) Semi-skilled workers	Four	1,200·00
(7) Helpers	Four	800·00
(8) Peon-cum- Chowkidar	Two	400·00
Total		7,900·00
Add 30% benefits		2,370·00
Total		10,270·00
Say		10,300·00

IX. Other Expenses (Per Month)

	Rs.
(1) Rent	3,500·00
(2) Power and water	650·00
(3) Postage and stationery	150·00
(4) Transport	500·00
(5) Insurance and taxes	100·00
(6) Maintenance	200·00
(7) Sales expenses	2,400·00
Total	7,500·00

X. Working Capital (Per Month)

	Rs.
(1) Raw Material	59,500·00
(2) Staff and labour	10,300·00
(3) Other expenses	7,500·00
Total	77,300·00
Working Capital for 3 months	2,31,900·00
Say Rs.	2,32,000·00

XI. Total Capital Investment

	Rs.
(1) Fixed Capital	94,000·00
(2) Working Capital (3 months)	2,32,000·00
Total	3,26,000·00

XII. Cost of Production (Per Annum)

	Rs.
(1) Raw Material	7,14,000·00
(2) Salaries	1,23,600·00
(3) Other expenses	90,000·00
(4) Interest on Capital Invest- ment @ 15%	48,900·00
(5) Depreciation on machinery @ 10%	9,400·00
Total	9,85,900·00
Say Rs.	9,86,000·00

XIII. Total Sales (Per Annum)

	Rs.
By sale of 4,800 Sewing Machines @Rs. 240/-	11,52,000

XIV. Profitability (Per Annum)

	Rs.
Total sale	11,52,000
Cost of Production	9,86,000
= Profit	1,66,000
(a) Percentage of Profit on sale	$\frac{1,66,000 \times 100}{11,52,000} = 14.5$
(b) Percentage of return	$\frac{1,66,000 \times 100}{3,26,000} = 50\%$

XV. Break Even Analysis

$$\text{BEP} = \frac{\text{Annual fixed cost} \times 100}{(\text{Fixed cost} + \text{Profit})}$$

Fixed cost (per annum)

	Rs.
1. Rent	42,000
2. Interest	48,900
3. Depreciation on machinery	9,400
4. 40% of salaries	49,440
5. 40% of other expenses	19,200
	1,68,940
Say	1,69,000

$$\text{BEP} = \frac{1,69,000 \times 100}{1,69,000 + 1,66,000} = 50.4\%$$

XVI. Addresses of Machinery and Equipment Suppliers

1. M/s. Maneklal & Sons,
115/116, Narayan Shun Street, Barbai
Mohalla Mandir, Bombay-400001.
 2. M/s. Jayems Engineering Co.
R. P. Road,
Secunderabad.
 3. M/s. Batliboi & Co.
40 Forbes Street,
Fort, Bombay.
 4. M/s. Quality Machine Tools.
J. C. Road,
Bangalore.
- Reserved item Sl. No. 531



I. Products and their uses

There are various types of domestic utensils in use in our household activities, specially for cooking and serving meals etc. The size, shape, design and materials differ from State to State and customer's preferences according to various income groups. To our rural folk, these are not only utility articles but are also security items. For this reason, brass and bell metal articles are preferred by rural population. For cooking facilities and also resale prospect, non-ferrous metals are preferred to stainless steel or ceramic utensils.

II. Market Potential

As presentation articles for marriage and other ceremonies, domestic utensils have got all India market. Consumer preference for non-ferrous metals are well known. If locally available there is good scope of marketing. For this reason, production with dispersal of industries in rural areas may offer sufficient scope of setting up number of units in rural areas. At present there are some centres of concentration like Moradabad or Mirzapur in U.P. wherefrom these articles are sent and sold all over India. Local availability may cut down the cost of marketing thereby increasing the scope of marketing.

III. Production Target

In this project, it is proposed to produce, per month, the following items:—

(1) Brass utensils	: 300 kgs.
(2) German/Nickle Silver Utensils	: 1 Quintal
(3) Copper Utensils	: 1 Quintal
(4) Bronze & Other Alloy Utensils	: 400 kgs.

IV. Production Details and Process of Manufacture

Non-ferrous metals in desired proportions are melted in crucibles and cast to billets. The billets are then rolled to size for cutting circles. The utensils are then formed by hammering. Certain articles such as tumblers are, however, cast to the designed shape and then polished after scraping. As regards composition of metal for brass 60:40 of Copper and Zinc is generally followed. For Nickel Silver, 60 per cent Copper, 18 per cent Nickel and 12 per cent Zinc may be used for economical operation. For, bronze or

bell metal, small scale units in rural areas may find difficulty in procuring virgin metals and alloying. In such cases, it is preferred to melt scrap of the same set of utensils of Copper, German Silver (Nickel Silver) or bronze may be manufactured. For the convenience of calculations only brass articles have been considered.

V. Quality Control and Standard

The following Indian Standard Specifications are available for domestic utensils which may be referred for guidance:

IS:422-1967—Brass Sheet and Strip for the manufacture of utensils.

IS:4822-1968—Brass Cooking Utensils.

IS:1550-1967—Copper Sheet and Strip for Utensils and general purposes.

VI. Land Any Building

	Rs.
Covered area of 40 square metres @Rs. 5/—per square metre per month	200/p.m.

VII. Machinery And Equipment

	Rs.
1. Fit Furnaces with Blower— 2 Nos.	3000
2. Buffing and polishing machines—2 nos.	2000
3. Hand Tools Work Bench and Vices—2 sets	2000
4. Towards installation electrification etc.	500
5. Furnitures and fixtures	500
	8000

VIII. Salaries and Wages (per month)

1. Skilled workers—2 nos	700
2. Semi skilled workers—3 nos.	750
3. Clerk-cum-storekeeper	400
4. Watchman	250
5. Labour amenities	300
	2400

X Raw Materials (Per month)	Rs.
1. Brass circles of various sizes @Rs. 27/-per kg—300 kgs	8100
2. Nickel silver circles of various sizes @Rs. 37/-per kg. 100 kgs.	3700
3. Copper Circles of various sizes @Rs. 32/- per kg—100 kgs.	3200
4. G. M. Bronze Copper and German Silver Scrap @Rs. 25 kg—400 kgs	10000
5. Crucibles (lump sum)	800
6. Soldering flux etc. (lump sum)	200
	26000

X. Other Expenses (Per month)	Rs.
1. Rent	200
2. Power & Electricity	100
3. Consumables maintenance etc	200
4. Transport and Conveyance	300
5. Contingencies	200
	1000

XI. Working Capital (3 month's recurring expenses)	
1 Salaries and wages	7200
2. Raw Materials	78000
3 Other expenses	3000
	88200

XII. Capital Investment	
1. Fixed	8000
2 Working	88200
	96200

XIII. Cost of Production (Annual)	
1 manufacturing expenses	352800
2. Depreciation of m/c @10% per annum.	800
3 Interest on capital investment @15% p.a.	14230
	367830

XIV. Sales Proceeds (Annual)	Rs.
By sales of—	
1. Brass Utensils @Rs. 36/- per Kg. —3600 kgs.	129600
2. German/Nickel Silver Utensils @Rs. 44/- per kg.—1200 kgs.	52800
3. Copper Utensils @Rs. 40 per kg—1200 kgs.	48000
4. Cast Utensils of different alloys chiefly nickel Silver Group @average Rs. 45/- per kg— 4752 kgs.	213840
	444240

XV. Profitability (Before Taxes)
Profit=XIV—XIII=Rs. 76410
Profit is 17% of sales and 79%
of capital investment.

XVI. Break Even Analysis

A. Fixed Cost	Rs.
1. Depreciation of m/c	800
2. Interest on capital	14330
3. Rent	2400
4. 40% of salaries & wages	11520
5. 40% of other expenses	3840
	32890

B. Net Fixed Cost=Rs. 32900

Break Even Point =Net Fixed cost × 100

$$\begin{aligned}
 & \frac{\text{Net Fixed Cost} + \text{profit}}{32900 \times 100} \\
 & = \frac{32900 \times 76410}{3290000} \\
 & = 109310 \\
 & = 30\%
 \end{aligned}$$

XVII. Sources of Machinery

1. International Machine Tools Corporation, 5 Bank Street, Behind State Bank, Fort, Bombay—400023
2. Asia Engineering Supply Stores, P-15 Bentink Street Calcutta-700001.
3. Kad & Co., Dariapur Char Rasta Ahmedabad-380001 (Reserved items Sl. Nos. 476 479 and 480)

DOMESTIC UTENSILS — IRON

I. Product and its uses

The use of domestic utensils made of steel plates are well known to every one as they are seen in house holds and sweet meat shops. Familiar items of such utensils are deep and shallow frying pans, spoons, Roti Roasting plate (Tawa), Tongs etc.

II. Market Potential

These items are required by all Sections of the Society whether they are rich or poor. As the population increases, the demand for these items also increase. Further these items have market in rural as well in urban areas. This industry is labour oriented using hand tools and hence can be dispersed over a wide area thus creating employment.

III. Production Target

It is proposed to manufacture 24 Tons of finished goods per month from 25 Tons of material. 1 Ton of scrap obtained during processing will be sold as scrap.

IV. Production details and process of manufacture

The steel plates of different gauges above 10 G. are taken and cut to the shape by chisels and hammers. Then they are hammered down to the shape on Anvils, cast Iron rings. The handles etc. are then rivetted to the main item. Tongs etc. are forged to shape in hot condition with use of hearth and Anvil.

V. Inspection and Quality Control

The finish should be such that there are no burrs, sharp edges which will harm the users while handling. The size of handles should be such that there is sufficient space to hold the handle by hand. The rivetting must be strong so that it will not give way within a short period. The tong arms should be forged to proper shape and rivetted properly so that whenever any utensil is held with the iron tongs, there is no slippage.

VI. Land & Building

Rs.

Covered Area 60 sq. metres (rented)	300·00
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VII. Machinery & Equipment

Blacksmithy hand tools, Anvil— 2 Nos.	
Sledge hammers—3 Nos. Blacksmithy hearths with hand blowers 2 Nos. etc.	5,000·00
Other measuring & marking instruments like calipers, dividers etc.	1,000·00
Total	6,000·00

VIII. Raw Materials (Per Month)

M.S. plates above 10 G. 20 Tons.	80,000·00
M.S. Rods 1/4" dia to 3/8" dia 5 Tons.	15,000·00
Total	95,000·00

IX. Staff & Labour (Per Month)

(1) Skilled workers . . . 3 .	1,200·00
(2) Semiskilled workers 2 .	500·00
(3) Helpers . . . 4 .	800·00
(4) Welfare facilities . . .	300·00
Total	2,800·00

X. Other Expenses (Per Month)

(1) Rent	300·00
(2) Coal	6,600·00
(3) Consumable tools . . .	50·00
(4) Cartage & freight . . .	625·00
(5) Sales expenses	125·00
(6) Stationery, Postage etc. .	100·00
Total	7,800·00

XI. Working Capital (Per Month)		Rs.
(1) Raw Material . . .		95,000·00
(2) Staff & Labour . . .		2,800·00
(3) Other expenses . . .		7,800·00
Total		1,05,600·00

XII. Total Capital Investment		
(1) Machinery & equipment		6,000·00
(2) Working capital for three months		3,16,800·00
Total		3,22,800·00

XIII. Manufacturing Cost (Per Month)		
(1) Raw materials		95,000·00
(2) Staff & Labour		2,800·00
(3) Other expenses		7,800·00
(4) Depreciation on machinery & equipments which are mostly tools taken on higher side of 20% per annum.		100·00
(5) Interest on Total capital investment at 15%		4,035·00
Total		1,09,735·00
Say		1,10,000·00

XIV. Total Sales (Per Month)		
By sale of 24 tons of finished goods at Rs. 4800/- per ton		1,15,200·00
By sale of 1 Ton of scrap		1,000·00
Total		1,16,200·00

XV. Total Profit (Per Month)		
Total profit = Total Sales—manufacturing cost =Rs. 1,16,200—Rs. 1,10,000 =Rs. 6,200/--		
Annual Profit = Profit per month × 12 =6200 × 12 =74,400·00		
(a) Percentage of profit on Sales Profit per month = $\frac{\text{Profit per month}}{\text{Sales per month.}} \times 100$ = $\frac{62,00}{1,16,200} \times 100$ =5·34%		

(b) Percentage of profit on total investment Annual profit = $\frac{\text{Annual profit}}{\text{Total capital Investment.}} \times 100$ = $\frac{74,400}{3,22,800} \times 100$ =23%		
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XVI. Break Even Analysis

Break Even Percentage = $\frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100$		
Fixed cost per month :		Rs.
(1) Rent		300·00
(2) 40% of staff & labour		1,120·00
(3) 40% of other expenses excluding rent		3,000·00
(4) Depreciation on machine & equipment		100·00
(5) Interest on total capital investment		4,035·00
Total		8,555·00

Annual fixed cost = 8,555 × 12
= 1,02,660·00

Break Even percentage = $\frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100$ = $\frac{1,02,660}{1,02,660 + 74,400} \times 100$ = $\frac{1,02,660}{1,77,060} \times 100$ =58%		
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XVII. Name and Address of Suppliers of Machinery, Equipment & Tools

- (1) Mehta Engineering Stores,
11, Industrial House,
51/53 Nagdevi X Lane,
Bombay-400003.
- (2) Hemco Corporation,
308, Bazargate Street,
Behind Reserve Bank,
Bombay-400001.
- (3) C. Bole & Co.
61, Narayan Dhuru Street,
Fort, Bombay-400003.

XVIII. Name and Address of Suppliers of Raw Materials

- (1) Nearest Sales Office of Steel Authority of India Ltd.

(Reserved item Sl. No. 447)

I. Product and its uses

With the development of automobile industry, ancillary units for the manufacture of various parts and sub-assembly has also become essential. Muffler or Silencer is one such part. It is required in cars, trucks and some industrial type of engines to minimise the noise created by the exhaust gases of the engine. The designs vary in size, shape and construction according to the type of vehicles.

II. Market potential

The production of passenger cars, commercial vehicles and jeeps are steadily increasing. Production of Silencers, therefore, has good scope both as original equipment and spare parts market. With the growth of economy and increase in road transport, the demand will increase still more. So the item is expected to have good prospect.

III. Production target

In this project, 400 silencers per month has been estimated.

IV. Production details and process of manufacture

The process of manufacture of this item is simple sheet metal working. The sheets are to be cut to size and formed to desired shape in edge folding machine and bending rollers. Necessary welding may be done by gas welding. In view of the simplicity of the operations, units in rural area can operate successfully with local artisans.

V. Quality control and standard

There is no Indian Standard Specification for this item. Quality standard of the item will have to be determined on the basis of customer's requirements. However, precaution against leakage of exhaust gas may be ensured in the production shop preferably after welding operation.

VI. Land and Building

120 square metres covered area to be rented at the rate of Rs. 5/- per square metre per month.

VII. Machinery and Equipment

1. Under crank Drive ungeared Guillotine Shearint Machine 16, S.W.G. x 1200 mm.	Rs. 15000
2. Hand operated Bending machine with slip out type rollers 1200 mm—2 nos.	2400
3. Edge Folding Machine—1200 mm	1700
4. Gas Welding Set with Accessories	1300
5. Bench Grinder	1600
6. Fly Press No. 10	4000
7. Tools and Dies	4000
8. Furnitures, Fixtures & Office equipment	7000
9. Installation and electrification	3000
	40000

VIII. Salaries and Wages (Per Month)

1. Manager	800
2. Storekeeper Clerk	500
3. Skilled workers—2 nos.	800
4. Semi Skilled workers—2 nos.	500
5. Unskilled workers—2 nos.	400
6. Watchman Cum Peon	200
7. Labour Amenities	500
	3700

IX. Raw Materials (Per Month)

1. M.S. Sheet 16 S. W. 1. M.T.	3000
2. M.S. Tubes 35 metres length @ Rs. 6/- per metre	210
3. Consumable stores	300
	3510
	3500

Rs. 600 Say

X Other Expenses (Per Month)	Rs.
1. Rent	600
2. Electricity charges	250
3. Transport, Packing Forwarding	500
4. Maintenance, Small Tools etc.	250
5. Contingencies	200
	<u>1,800</u>

XI. Working Capital (3 month's recurring expenses)

1. Salaries and wages	11,100
2. Raw materials	10,500
3. Other expenses	5,400
	<u>27,000</u>

XII. Capital Investment

1. Fixed	40,000
2. Working	27,000
	<u>67,000</u>

XIII. Cost of Production (Annual)

1. Salaries and wages	44,400
2. Raw Materials	42,000
3. Other expenses	21,600
4. Depreciation of m/c @ 10% per annum	4000
5. Interest on Investment @ 15% per annum	10,050
	<u>1,22,050</u>

XIV. Sales Proceeds (Annual)

By sales of various types of Silencers
@ average Rs. 32/- each 4800
nos. 1,53,600

XV. Profitability (Before taxes)

$$\text{Profit} = \text{XIV} - \text{XIII} = \text{Rs. } (153600 - 122050) \\ = \text{Rs. } 31500$$

The profit is 20.5 % of sales and 47% of Capital investment.

XVI. Break Even Analysis

Fixed cost :

1. Depreciation of machinery	4,000
2. Interest on Investment	10,050
3. Rent	7,200
4. 40% of Salaries and Wages	17,760
5. 40 % of other expenses	5,760
	<u>44,770</u>

$$\text{Break Even Point} = \text{Fixed cost} \times 100$$

$$\frac{\text{Fixed cost} + \text{Profit}}{= 44770 \times 100} \\ \frac{44770 + 31550}{4477000} \\ \frac{76320}{= 58\%}$$

XVII. Sources of Machinery

1. International Machine Tools Corporation,
5 Bank Street, P.O. Box 799, Fort, Bombay-
400023.
2. Atlas Works,
119 Ripon Street, Calcutta-700016.
3. Ashoka Bros.,
37 Panchkuin Road, New Delhi-110001.

(Reserved item Sl. No. 652).

FRONT FORK CROWN COVER OF BICYCLE

I. Product and its uses

1. Front fork crown cover is a sheet metal part to cover the crown of the fork. It is merely a decorative piece and it has no technical function to perform. It is used by the cycle fork manufacturers. Due to the ever increasing demand of the bicycles, this item also has a good demand potential.

II. Production Targets

It is proposed to manufacture 1,250 gross crown covers per month.

III. Production details and process of manufacturing

Fork Crown Covers are manufactured out of 24 gauge C.R.B.P. Sheet. The manufacturing process is carried out on the Power Press. The different operations are Blanking, drawing, piercing and trimming. It is sold to the fork manufacturers in its natural finish and they get it electroplated as per their own requirements.

IV. Inspection and Quality control

This is not precision item and, therefore, it does not require much equipment for quality control. The main requirements for the making of good quality crown covers is the C.R.B.P. sheet without any cracks, pittings, rust and other surface defects. The sheet should have uniform thickness. The dimension can be maintained by checking the dies and punches regularly with the help of precision measuring tools. I.S.I. has laid down the standards for the bicycle front for (IS: 2061-1962) and the same can be used as guidelines for the crown covers.

V. Land and Building

Land 250 sq. metres.

Covered Area 100 sq. metres.

Rented Rs. 500 P.M.

VI. Machinery & Equipments

Rs.

1. Power Press 25 ton cap. Pillar type C.I. body with 3 H.P. electric motor and starter . 2 No. 20,000

	Rs.
2. Power Press 5 tons cap. Inclined type C.I. body with H.P. motor & starter . 1 No. electric	5,000
3. Power Press—10 tons cap. Inclined type C.I. body with 2 H.P. motor & starter . 1 No.	6,500
4. Power Press 3 tons cap. Inclined Type with 1 H.P. motor & starter . 1 No.	4,000
5. Double Ended Grinder 0.75 H.P. . 1 No.	1,200
6. Roller Type Sheet Shearing Machine with 1 H.P. electric motor and starter . 1 No.	4,000
7. Dies, Jigs, Fixtures & Tools L.S.	10,000
8. Erection, installation charges L.S.	4,100
9. Office Furniture & Equipments L.S.	2,000
	56,800
	57,000
Say	

VII. Raw Material per month

1. C.R.B.P. Sheet 24 gauge 17.50 M.T. @Rs. 5000 per M.T. 87,500

VIII. Staff and Labour (per month)

1. Foreman	1 No.	600
2. Skilled Worker	5 Nos.	1500
3. Helper	1 No.	200
4. Accountant/Clerk	1 No.	400
5. Watchman cum peon	1 No.	200
6. Sweeper part-time	1 No.	50
		2,950
	Say	3,000

IX. Other Expenses per month

Rs.

1. Rent	500
2. Electricity and wayer charges	300
3. Oil and Lubricants	100
4. Postage and Stationery	100
5. Cartage & freight	350
6. Packing	100
7. Repair & Maintenance	800
8. Misc. Expenses	800
	3,050
Say	3,100

X. Working Capital required for three months

1. Raw Materials	$87,500 \times 3$	2,62,500
2. Salary & Wages	3000×3	9,000
3. Other Expenses	3100×3	9,300
		2,80,800

XI. Total Capital Investment

1. Total Fixed Investment of plant & machinery	57,000
2. Working Capital for three months	2,80,800
	3,37,800

XII. Cost of Production per annum

1. Recruiting expenses $2,80,800 \times 4$	11,23,200
2. Interest on Capital Investment @15 per cent	50,670
3. Dep. on plant and machinery 10 per cent	5,700
4. Sales Expenses (L.S.)	11,000
	11,90,570
Say	11,90,600

XIII. Sales Proceeds per annum.

1. By sale of 14,880 gross of crown covers @ Rs. 83 per gross	12,35,040
2. By sale of 15,000 gross circles @ Rs. 5.00 per grs. and scrap	75,000
	13,10,040
Say	13,10,000

XIV. Profitability per annum.

Rs.

$$\text{Profit} = \text{Total Sales} - \text{Cost of production.} \\ = 13,10,000 - 11,90,600 = 1,19,400$$

a. Percentage of profit on sales.	$\frac{1,19,400 \times 100}{13,10,000} = 9.11\%$
b. Per cent of return on investment	$\frac{1,19,400 \times 100}{3,37,800} = 35.35\%$

XV. Break even analysis.

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost plus profit.}}$$

Fixed Cost (per annum)

Rs.

1. Rent	6,000
2. Interest on Capital	50,670
3. Depreciation	5,700
4. 40% of salaries	14,440
5. 40% of other expenses	14,880
	91,650
Say	91,700

$$\text{B.E.P.} = \frac{91,700 \times 100}{2,11,100} = 43.44\%$$

Names and addresses of Suppliers of machinery.

M/s. Mankoo Industries.
Industrial Area 'B' Ludhiana.

M/s. Ameteep. Machine Tools Pvt.
14/7 Mathura Road, Faridabad.

M/s. Atlas Works Pvt. Ltd.
119, Repen Street, Calcutta.

M/s. Burma Mech. Works,
258, Ind. Area 'A' Ludhiana.

M/s. Milhard & Co. Pvt. Ltd.
Miller Ganj. G.T. Road, Ludhiana.

(Reserved item Sl. No. 701)

I. Product and its uses

The drying of farm products is an essential phase of agricultural storage and marketing requirements. Many farm products, when harvested contain too much moistures for safe storage. Manufactured Crop Dryers may be divided into 2 classes, namely the continuous flow and the batch. Portable batch dryers have better marketing scope; so, the project profile has been drawn up for this type only. Grain Dryers upto 5 H.P. motive power has been reserved for production exclusively in the small scale sector.

II. Market Potential

Day by day modernisation of agricultural production methods are developing in our country. Further momentum is anticipated with the latest policies of the Government. As such, it is expected to give a spurt to the existing demand in the country. In view of this small scale industries in semi-urban centres are expected to find good marketing scope of their products. For successful marketing, after sales service is an essential feature for this line.

III. Production Target

Although there are various sizes and types of Grain Dryers in demand, the estimate in this profile has been worked out on the basis of 5 nos., of smaller size of Dryers per month. Installed capacity however is suitable for higher sizes and quantity of production.

IV. Production Details and Methods of Manufacture

The manufacturing is to be carried out with general purpose sheet metal fabrication machines. The blower motor and accessories are to be purchased from outside. Similarly thermostat and other equipment of specialised nature also will have to be procured from outside.

V. Quality Control and Standards

There is no I.S.I. Specification for this item. The production of individual components should be checked before welding. Cleaning and polishing of welding joints will have to be thoroughly observed.

VI. Land and Building

	Rs.
100 sq. metre of covered area to be rented @ Rs. 5/- per sq. metre per month	500

VII. Machinery and Equipment

1. Welding Transformer 25—300 am-pers cap	7000
2. Heavy duty Gas Cutting & Welding Set	1500
3. Oxy-acetylene Profil Cutting machine same as model "Cheetah" (solid State Control) of Indian Oxygen Ltd.	4000
4. 18 mm capacity Pillar Drill M/dc.	2700
5. Portable Hand Drilling Guns—2 nos.	1300
6. S.S. & S.C. Lathe 6'—0" bed	16000
7. 7" Mechanical Hacksaw machine	2500
8. Guillotine shearing machine (Treadle)—1200 mm capacity	5000
9. Bench Grinder	1500
10. Portable Heavy duty Grinder same as 'Wolf C.Q. 4' type	800
11. Portable sander	700
12. Spray Painting machine	2000
13. Work Bench vises, Hand tools	5000
14. Furnitures and office equipment	6000
15. Installation, electrification	4000
	60000

VIII. Salaries And Wages (Per Month)

	Rs.
1. Engineer	1400
2. Draughtsman/Inspector	700
3. Storekeeper cum Accountant	600
4. Typist cum Clerk	500
5. 3 Skilled workers @ Rs. 400 per month	1200
6. 6 Semi-skilled workers @ Rs. 250 per month	1500
7. 4 Unskilled workers @ Rs. 200 per month	800
8. 2 Watchmen cum Peon @ Rs. 250 per month	500
9. Labour amenities	1400
	8600

IX. Raw Materials (Per Month)

	Rs.
1. M.S. Sheets, rods and other sections @ average Rs. 3200 per m. tonne—3.5m. tonnes	11200
2. 5 electric motors and other accessories	9500
3. Sundries	700
	21400

X. Other Expenses (Per month)

	Rs.
1. Rent	500
2. Consumable stores such as welding rods etc.	1200
3. Maintenance and replacement of small tools	600
4. Transport, Packing and Conveyance	2000
5. Power and electricity	400
6. Contingencies	300
	5000

XI. Working Capital (3 Months' Recurring)

	Rs.
1. Salaries And Wages	25800
2. Raw Materials	64200
3. Other Expenses	15000
	105000

XII. Capital Investment

	Rs.
1. Fixed	60000
2. Working	105000
	165000

XIII. Cost of Production (Annual)

	Rs.
1. Salaries and wages	103200
2. Raw Materials	256800
3. Other Expenses	60000

4. Depreciation of machinery @ 10 % per annum	6000
5. Interest on Capital Investment @ 15 % per annum	24750
6. Marketing expenses 12 % of Sales	72000
	522750

XIV. Sales Proceeds (Annual)

By Sales of 60 nos. of Grain Dryers @ Rs. 10000/-average	Rs. 600000
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XV. Profitability (Before Taxes)

	Rs.
Profit=XIV—XIII=Rs. 600000—522750)=Rs. 77250	
The profit is 12.8 % of Sales and 46.8 % of Capital Investment.	

XVI. Break Even Analysis*Fixed Cost:*

1. Depreciation of machines	6000
2. Interest on Capital Investment	24750
3. Rent	6000
4. 40 % of Salaries and Wages	41280
5. 40 % of other expenses	21600
	99630

Break Even Point

Fixed cost × 100
Fixed cost + Profit
99630 × 100
99630 + 77250
= 56 %

XVII. Sources of Machines

1. Machine Tools Traders (Cal.) 25 Ganesh Chandra Avenue, Calcutta.
2. Indian Oxygen Limited, Oxygen House, P-34 Tara-tala Road, Calcutta-700053
3. Ashok Metal Industries Tagore Road, Bhaktinagar, Rajkot-360002.
4. CIMOTEC, 44-B Sheshadripuram, Main Road, Bangalore-20.

(Reserved item Sl. No 503)

I. Project and its uses

Grease nipple may be termed as auxiliary Grease feeding attachment in a machine where anti-friction bearings are used for withstanding dynamic load. These nipples are extensively used in industrial machinery, machine tools, automobile, Locomotive, Air craft and other machines.

II. Market potential

With the phenomenal growth in industry in many sphere it is needless to say that the demand for grease nipple has also increased proportionately. Apart from demand from the industries it has substantial sale in the replacement market. Even in the absence of specific statistics, it can be said that with further expansion of industries and its diversification in other fields. There will remain a steady demand for the product.

III. Production Target

There are many types of Grease nipple of different sizes and design specification. In this project only common type of nipple within the range of 12mm to 18mm have been considered. Annual production has been estimated at 40,000 dozs. on single shift operation, considering 25 working days in a month. Rejection have been estimated 2.5 per cent approx.

IV. Production detail and process of manufacture

For mass production grease nipples are turned in single spindle automats. These machines are cam-operated and operation can be suitably overlapped to minimise operation time and thereby production cost. Free cutting steel hexagonal bar is fed in the machine, and a nipple is turned out within specific time cycle. Nipple tips are normally hardened and the body cadmium plated. In the project it has been assumed to get these done by sub-contracting on outside firms having such facilities. When nipples are received back after such operation, they are assembled with coiled spring and hardened steel balls, which are purchased components. After assembly the back end of the nipples are punched or form pressed to squeeze the face dia of the hole for fixing up the spring inside the nipple.

V. Inspection and quality control

Proper check is necessary at different stages to control quality of the product. In all cases adequate

care has to be taken to ensure standard supply of raw material and other purchased components. When production of nipple is in progress, samples after specific time interval have to be drawn from the machine and thoroughly checked for standard dimensions. In case any deviation is observed from the standard, the tools or the machine may have to be reset. Standard measuring gauges such as micrometer, vernier, form gauges will be necessary to have necessary control on quality of product.

VI. Land and Building

Covered area for workshop, office & store—100 sq. metres approx.	Rented.
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VII. Machinery & equipment

		Rs.
1. Single spindle automat 20 mm capacity, motor 3 H.P. for main drive and 0.75 HP for turret head with accessories	1 No.	60,000.00
2. Single spindle automat 25mm capacity motor 5 H.P. for main drive and 0.75 HP for turret head with accessories	1 No.	70,000.00
3. Bench type double ended tool grinder 8" wheel	1 No.	1,000.00
4. Hand operated screw press No. 3	2 Nos.	1,500.00
5. Hand tools and measuring instruments	L.S.	3,000.00
6. Installation & Electrification	L.S.	3,000.00
7. Furniture and fixtures	L.S.	1,500.00
		1,40,000.00

VIII. Raw material (per month)

	Rs.
1. Free cutting steel hex. bar 12mm to 18mm	1.75 M. Ton @4000/- 7,000.00
2. Coiled spring 3mm O.D. or to suit nipple	40,000 nos. @5 n.p. 2,000.00
3. Steel ball 2.5 mm or to suit nipple	40,000 nos, @ 3 n.p. 1,200.00
	<u>10,200.00</u>

IX. Staff & Labour (per month)

	Rs.
1. Manager (Technical) . . . 1 No.	800.00
2. Skilled operator cum tool setter 1 No.	500.00
3. Semi skilled operator . . . 3 No.	750.00
4. Labour 1 No.	200.00
5. Clerk cum store keeper . . . 1 No.	350.00
6. Watchman 1 No.	200.00
	<u>2,800.00</u>
Cost of labour benefits @ 10%	280.00
	<u>3,000.00</u>

X. Other expenses (per month)

1. Rent	500.00
2. Electricity	300.00
3. Consumable tools etc.	400.00
4. Sub-contract charges for hardening nipple tip @ 5 n.p. each for 40,000 nos.	2,000.00
5. Sub-contract charges for Cadmium plating @10 n.p. each	4,000.00
6. Sub-contract charges for cam for the automats(L.S.)	1,000.00
7. Repair & maintenance	200.00
8. Oils, lubricants, cool- ant etc.	200.00
9. Packing & forwarding	500.00
10. Misc. office expenses	500.00
	<u>9,595.00</u>

Working capital (per month)

	Rs.
1. Raw material	10,200.00
2. Staff & Labour	3,080.00
3. Other expenses	9,595.00
	<u>22,875.00</u>
Say	<u>23,000.00</u>

XII. Total capital Investment

	Rs.
1. Non-recurring	1,40,000.00
2. Recurring × 3 months	69,000.00
	<u>2,09,000.00</u>
Say—	<u>2,10,000.00</u>

XIII. Cost of production (per annum)

	Rs.
1. Raw material	1,22,400.00
2. Staff & Labour	36,960.00
3. Other expenses	1,15,140.00
4. Interest on capital @ 15% p.a.	31,500.00
5. Depreciation of machinery @ 10% p.a.	14,000.00
	<u>3,20,000.00</u>

XIV. Total Sale (per annum)

By sale of 39,000 doz. of grease nipple of assorted sizes i.e. 12mm to 18mm @ Rs. 10/- per doz. (average), less rejection @ 2.5%	<u>3,90,000.00</u>
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XV. Profitability (per annum)

1. Total sale	3,90,000.00
2. Cost of production	<u>3,20,000.00</u>
Profit	<u>70,000.00</u>
(a) Percentage of profit on sale =	$\frac{70,000 \times 100}{3,90,000}$ = 18% approx.
(b) percentage of return on capital	$\frac{70,000 \times 100}{2,10,000}$ = 33% approx.

XVI. Break even analysis

$$\text{BEP} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{Annual Profit}}$$

Annual fixed cost

	Rs.
1. Rent	60,000.00
2. Interest	31,500.00
3. Depreciation of machinery	14,000.00
4. 40% of salary	14,780.00
5. 40% of other expenses	40,056.00
	1,12,340.00
Say	1,12,000.00

$$\text{BEP} = \frac{1,12,000 \times 100}{1,12,000 + 70,000} = 61\% \text{ approx.}$$

XVI. Names & address of machinery dealers :

1. M/s. Chowgales, "Bakhtawar" 4th Floor,
Nariman Point, Bombay-20.
2. M/s. Perfect Machine Tools Co. Pvt. Ltd.,
20A, Camac St., Calcutta-16.

(Reserved Item Sl. No. 626)

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I. Product and its use

Bushes are generally used to save the costly precision and revolving shaft or piston from normal wear and tear as they bear the load. By changing bushes or reconditioning it for proper bearing, the costly machinery can be saved from early deterioration. Gun Metal Bush as its name clearly indicate is a bush made of Gun Metal. Gun Metal is an alloy of Copper, zinc, lead and tin. The common composition is copper 85 per cent, Zinc 5 per cent, lead 5 per cent and Tin 5 per cent.

II. Market Potential

Gun metal bush is a fast consuming item in the Mechanical Engineering line, it is needed. In good numbers in almost all the machinery and have a good demand as spare also.

III. Production Target

Gun metal bushes upto 2" dia x 3" length is widely used in day to day Engineering life. Generally upto 1" dia bushes are made from solid bar and bigger diameter bushes are casted. In this scheme small bushes upto 1" dia 18000 Nos. and other bushes 3600 Nos. per annum have been taken into consideration.

IV. Production detail and process of manufacturing

Small bushes will be made from solid bar by boring in the Capstan Lathe and casted bushes will be finished in the Lathe machine by turning and boring. Casting of bushes save much labour and material in comparison to the bushes made from solid bar. Scrap and rejected bushes can be used again in the casting operation. The manufacturing process involved in the machine are simple for a standard machine operator.

V. Inspection and Quality control

Inspection of bushes are made in two ways:—

(i) Visual (ii) Dimensional. Bushes should be free from any blow hole, pin moles and have a smooth surface all over. Dimensional inspection is made with the help of Micrometer, Caliper and such standard gauges. Much precision checking instruments are not necessary. The bushes should not be fitted loosely and should have provision for lubrication.

VI. Land & Building

Covered area 20' X 20'	Rented	Rs. p.m. 200.00
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VII. Machinery & Equipment

		Rs.
1. 4' Bed Lathe machine with standard accessories, electrical fittings & 2 H.P. Motor	1 No.	9,000.00
2. 25mm Capstan Machine with standard accessories, electrical fittings (2 H.P. Motor)	1 No.	5,000.00
3. Double Ended 6" wheel Grinding Machine with electrical fittings and 1 H.P. Motor	1 No.	1,200.00
4. Measuring tools and Instruments	L.S.	800.00
5. Installation & Furniture	L.S.	2,000.00
		18,000.00

VIII. Raw material (per month)

	Rs.
1. Gun metal bar upto 1" dia 200 Kg @Rs. 30/- per kg.	6,000.00
2. Cast assorted gun metal bushes 500 Kg @ 35/- per kg	17,500.00
	23,500.00

IX. Staff and Labour (per month)

	Rs.
1. Supervisor . . . 1 No.	600.00
2. Clerk/Store Keeper . . . 1 No.	300.00
3. Machine Operator . . . 2 Nos.	600.00
4. Helper . . . 2 Nos.	400.00
5. Watchman . . . 1 No.	200.00
	2,100.00

6. Cost of labour benefits @10%	210· 00
	<u>2,310· 00</u>
Say	<u>2,300· 00</u>

X. Other expenses (per month)

	Rs.
1. Rent	200· 00
2. Electricity	150· 00
3. Consumable stores	100· 00
4. Cartage & freight	200· 00
5. Packing and Forwarding	300· 00
6. Publicity	100· 00
7. Maintenance	200· 00
8. Other consumable oil, lubricant etc.	150· 00
9. Sales expenses including travelling	300· 00
10. Stationery, postage, insurances etc.	100· 00
	<u>1,800· 00</u>
Rs.	

XI. Working Capital (per month)

1. Raw material	23,500· 00
2. Staff and labour	2,300· 00
3. Other charges	1,800· 00
	<u>27,600· 00</u>
Rs.	

XII. Total Capital Investment

1. Machinery & Equipment	18,000· 00
2. Working capital for 3 months	82,800· 00
	<u>1,00,800· 00</u>
Rs.	

XIII. Cost of production (per annum)

	Rs.
1. Raw material	2,82,000· 00
2. Staff & Labour	27,600· 00
3. Other charges	21,600· 00
4. Interest on capital investment @15%	15,120· 00
5. Depreciation on Machinery and Equipment @10%	1,800· 00
	<u>3,48,120· 00</u>
Rs.	

XIV. Total Sale (per annum)

1. By sale of 18000 Nos. of G.M. bushes upto 1" diameter	@Rs. 13/- per Bush	2,34,000· 00
2. By sale of 3600 Nos. of Gun metal bushes upto 2" dia. assorted	@Rs 39/- per bush	1,40,400· 00
		<u>3,74,400· 00</u>
3. By sale of scrap		5,600· 00
	Rs.	<u>3,80,000· 00</u>

XV. Profitability (per annum)

	Rs.
Total Sale	3,80,000· 00
Cost of production	3,48,120· 00
	<u>Rs. 31,880· 00</u>
1. Percentage of profit on sale	$\frac{31880 \times 100}{390000} = 8\% \text{ approx.}$
2. Percentage of return over capital investment	$\frac{31880 \times 100}{1,00,800} = 31.6\% \text{ approx.}$

XVI. Break Even point Analysis

$$\text{BEP} = \frac{\text{Annual Fixed cost} \times 100}{\text{Annual fixed cost} + \text{Annual profit}}$$

$$= \frac{36240 \times 100}{36240 \times 31880} = \frac{3624000}{68120} = 53.1\% \text{ approx.}$$

Annual fixed cost

1. Rent	2,400· 00
2. Interest	15,120· 00
3. 40% of staff & Labour	11,040· 00
4. 40% of other charges	7,680· 00
	<u>Rs. 36,240· 00</u>

XVII. Name and address of Machinery Suppliers

1. M/s. Power Tools & Appliances Co. Ltd.,
2, B.B.D., Bagh,
Calcutta-1.
2. M/s. Batliboi & Co. (P) Ltd.,
26, R. N. Mukherjee Road,
Calcutta-1.
3. M/s. Turner & Tools,
15, Ganesh Chandra Avenue,
Calcutta-13.
4. M/s. Turnwell Machine Tools,
16, Ganesh Chandra Avenue,
Calcutta-13.

(Reserved item Sl. No. 627)

I. Product and its uses

Various types of carts have been in use in our country from the time immemorial. It is a mode of transport for carrying goods over short distances. Because of the economic weakness of our masses, the hand carts and animal driven carts are still in use due to very less cost of running them. Also due to large scale unemployment hand carts provide a source of employment to a small family. Carts are used to carry raw materials, semi finished and finished products from the place of manufacture to the rail or road head or to the doors of dealer or consumers. Further due to availability of cheap animal power, the demand for various types of carts grows every year.

II. Production Targets

It is proposed to make 600 carts of different types and sizes per annum.

III. Production details and process of manufacture

Almost all types of carts are made out of hard wood. The wooden planks and beams are cut on band saw, planed on wood planer, grooved joined and screwed or bolted to make a strong frame. Afterwards, the wooden members are reinforced by steel flats and strips and decorated by ornamental metallic flowers etc. The axles are forged in a smith's hearth with the help of hand tools. The wheels are made out of wooden segments joined together and then fitted with a steel rim to make it stronger and last longer. The cart is then ready for marketing.

IV. Inspection and Quality Control

There are not very rigid specification for the manufacture of Carts. Only good quality wood with sufficient thickness of different members to withstand the maximum possible loads are required to be used. Also it should be seen that the wooden and steel members are smoothened nicely and corners are rounded off to minimise the dangers of hurting the humans and animals.

V. Land and Building

A plot of about 500 metres with a covered shed of 100 sq. metres is required 40,00

VI. Machinery & Equipments

	Rs.
1. Band Saw 36" with 7 HP Motor . . . one.	6,000
2. Band Saw brazing equipment . . . one.	1,000
3. Saw sharpening machine with saw setting attachment with one HP Motor . . . one.	3,000
4. Circular saw 12" with Motor . . . one.	2,000
5. Jointer-cum-Thickness Planer 12" × 6" with Motor—3 HP . . . one.	8,000
6. Knife sharpening machine with 1/2 HP Motor . . . one.	1,000
7. Portable drill machine with stand one, 1/2" cap. with 1/2 HP Motor	1,500
8. Double Ended Grinder 10" with Motor 1/2 H.P.	1,000
9. Wood Turning Lathe 3' × 6" Centre with 3 HP Motor . . . one	2,500
10. Electric Welding set . . . one.	3,000
11. Set of carpentry and black smith tools . . . 4 Sets	4,000
12. Work tables 2 Nos.	1,000
13. Office furniture	3,000
14. Installation and electrification	3,000
Total	40,000

VII. Raw Material (per Month)

1. Hard wood—100 C. ft.	Rs.	4,000
2. M.S. Flats Rounds, welding rods and other hardwares etc.		3,000
		7000

VIII. Staff & Labour Per Month

	Rs.
1. Foreman . . . one.	600
2. Skilled workers . . 2 Nos.	800
3. Semi-skilled workers . 2 Nos.	500
4. Machine Man . . . 2 Nos.	700
5. Helpers 4 Nos.	800
6. Welder-cum-fitter . . 1 No.	300
7. Watch-keeper-cum peon 2 Nos.	400
8. Accountant-cum-clerk (Part-time) . . . 1 No.	200
Rs.	4,300

IX. Other Expenses per month

	Rs.
1. Electricity and water	750
2. Consumable tools	100
3. Oil & Lubrication etc. . . .	100
4. Postage & stationery	50
5. Travelling, freight and other expenses	200
Rs.	1,200

X. Working Capital for three months

	Rs.
1. Raw Material	21,000
2. Salaries	12,900
3. Other expenses	3,600
Rs.	37,500

XI. Total Capital Investment

	Rs.
1. Land and building	40,000
2. Machinery & equipment . .	40,000
3. Working capital for 3 months .	37,500
Rs.	1,17,500
Say Rs.	1,18,000

XII. Cost of Production per annum

	Rs.
1. Working capital (recurring Expenses)	1,50,000
2. Interest on capital @5% . . .	17,700
3. Depreciation on machines @10% .	4,000
4. Depreciation on building @5% .	1,000
5. Sales expenses	2,000
Rs.	1,74,700
Say Rs.	1,75,000

XIII. Sales Proceeds per Annum

	Rs.
By sale of different types and sizes of carts average @Rs. 690/- per Cart for 300 Carts per annum .	2,07,000

XIV. Profitability

	Rs.
Profit = Total Sales less cost of production = 2,07,000—1,75,000/- = Rs. 32,000/-	

(i) Percentage of profit on sales = 15%

(ii) Return on investment . . . = 27%

XV. Break Even Analysis:

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{Profit}}$$

Fixed cost per annum.

	Rs.
(i) Depreciation	5,000
(ii) Interest on capital	17,700
(iii) 40% of salaries	20,640
(iv) 40% of other expenses . . .	5,760
Total Rs.	49,100

$$\text{B.E.P.} = \frac{49100 \times 100}{49100 + 32000}$$

$$= \frac{49100 \times 100}{81100} = 60\%$$

XVI. Names and addresses of machinery suppliers

1. M/s. Batliboi & Co., P. Ltd.
190-A, Forbes Street, Bombay-1.
2. M/s. Perfect Machine Tools Co. P. Ltd.
Bell Building, Sir P. M. Road,
Bombay-1.
3. M/s. Maneklal and Sons,
Narayan Dhuru Street,
Bombay.
4. M/s. Sundeep Sales Corpn.
Civil Lines, Ludhiana.
5. M/s. Toshniwal & Brothers,
Jhandewalan Extension/New Delhi.

(Reserved items Sl. No. 730, 731)

I. Introduction

(a) Hand tools are implements used for various operations by hand while not using power. Such tools are required by carpenters, masons, fitters, electrician, repair & servicing workshops.

There are many varieties of pliers according to applications and use in the category of pliers. This project profile deals with the most commonly used pliers such as flat nose pliers, round nose pliers, burner pliers, combination side cutting pliers, duck-beak pliers and fencing pliers.

(b) *Market potential:* For pliers of different types and sizes demand emanate from the repair & servicing workshops. With the growth of industrial development, the relative growth of these workshops tools are in the increase. The requirements of pliers of different types, depending upon their usage, has a good market potential.

II. Production Target

It is proposed to manufacture 60,000 Nos. per annum of assorted types and sizes of pliers.

III. Production Detail and Process of Manufacture

The proposed scheme envisages the manufacture of pliers of six different types in three different sizes. The main operation involved in the manufacture are as follows:—

1. Cutting to length.
2. Heating and rough forging to shape.
3. Staping
4. Trimming.
5. Finish machining and hand finishing.
6. Heat treatment and colouring.

IV. Quality Standards and Specifications

The material, manufacture, workmanship and finish, tests, preservation and packing and sampling must conform to IS: 2615—1964.

The jaws shall have a hardness within the range of 450 to 700 HV, and the side cutting of hardness within the range of 600 to 700 HV or its equivalent on other scales. The hardness may be tested in IS: 2615—1964.

Handle load tests for deflection and permanent set in accordance with IS: 2615—1964 may be carried out.

The following ISI standards may be followed for product specification, performance and tests:

IS:3652—1966—Flat nose pliers.

IS:3568—1966—Round nose Pliers

IS:3650—1966—Combination side cutting Pliers

IS:4481—1968—Duckbell pliers

IS:5067—1969—Fencing Pliers

IS:2615—1964—General requirement

IS:5995—1971—Pipe grip pliers

V. Land and Building: (Rented)

	Rs.
Covered area—350 sq. metres	750' 00

VI. Machinery And Equipment.

1. Pneumatic hammer 50 kg. weight one	60,000' 00
2. Bar heating furnace oil fired muffle type 24" × 24" size with temp control one	20,000' 00
3. Friction screw press 250 tons cap. with ejection system one	1,20,000' 00
4. Horizontal milling m/c hand operated desk length 24" 5 Nos.	75,000' 00
5. Power press crane type column model—40 tons cap. one	25,000' 00
6. Pillar drilling machine 3" cap. 2 nos.	16,000' 00
7. Pedestal grinder 10" wheel dia. double ended 2 nos.	8,000' 00
8. Heat treatment furnace electrically heated temp. upto 100 C one	30,000' 00

9. Shaping machine 4' stroke gear type	one	22,000.00
10. Spray painting equipment with compressor & spray gun	one	6,000.00
11. Centre lathe 6' bed gap bed Hanter Hicut	one	35,000.00
12. Hardness testing machine	one	12,000.00
13. Abrasive cut off machine cap. upto 1" dia	one	6,000.00
14. Hammer type rivetting m/c heavy duty	one	6,000.00
15. Vertical type hand operated injection melting m/c 12 ⁰ Z	one	3,000.00
16. Installation and reaction charges		10,000.00
17. Work benches, tables & racks		3,000.00
18. Dies, tools—jigs & fixtures		50,000.00
19. Office equipment and workshop furniture		5,000.00
	Rs.	50,12,000/-

VII. Raw Material And Bought Out Components Per Month

1. Carbon steel—EN9 or equivalent	Rs.	
@Rs. 9,000/- per ton in rounds & flats assorted : 1 metric ton	9,000.00	
2. M. S. Round bar—50 Kg. @ Rs. 5/- per kg.	250.00	
3. PVC granules—100 kg. @Rs. 9/- per kg.	900.00	
4. Lubricants, cutting oils, cotton-waste, Acids, Furnance oil, cutting tools, etc.	1,650.00	
5. Other miscellaneous items	200.00	
	Rs.	12,000.00

VIII. Staff And Labour Per Month

A. Administrative and Supervisory.

		Rs.	
1. Engineer-cum-Manager	1	1,000.00	
2. Forging Supervisor	1	700.00	
3. Inspector	1	500.00	
4. Ministerial staff	3	1,200.00	
5. Peon	1	200.00	
6. Chowkidar	1	200.00	
	Rs.	3,800.00	

B. Technical & Others.

1. Forging skilled operators	3 @Rs. 600.00	1,800.00
2. Machine operators	8 @Rs. 400.00	3,200.00
3. Fitters	2 @Rs. 350.00	700.00
4. Helpers	3 @Rs. 200.00	600.00
5. Packers	1 @Rs. 200.00	200.00

	Rs.	6,500.00
Total A+B		10,300.00
Staff Welfare @30%		3,900.00
	Rs.	13,390.00

X. Other Expenses.

1. Electricity & Water	600.00
2. Maintenance & repairs	200.00
3. Printing, postage & stationery	200.00
4. Consumable stores	250.00
5. Advertisement and publicity	250.00
6. Transportation charges	250.00
7. Taxes	250.00
8. Other miscellaneous expenses	200.00
9. Rent	750.00
Rs.	2,900.00

X. Working capital per month

1. Raw Materials	.	.	.	.	12,000.00
2. Personnel	.	.	.	.	13,390.00
3. Other expenses	.	.	.	.	2,900.00
				Rs.	<u>28,290.00</u>

XI. Capital Investment.

1. Machinery & Equipment	5,12,000.00
2. Working capital for 3 months	84,870.00
Rs.	5,96,870.00

XII. Cost. of Production/per month.

1. Recurring Expenses		28,290.00
2. Insurance		500.00
3. Depreciation machinery & equipment @ 10% (say)		4,270.00
4. Interest on capital investment @15% (say)		7,340.00
	Rs.	40,400.00

XIII. Bales Proceeds.

By sale of different sizes and types of pliers of assorted variety of 5,000 nos.
@average price of Rs. 10/- per piece. Rs. 50,000.00

XIV. Profitability per Month

Profit : Sales—cost of production : Rs. 50,000—
40,400·00 = Rs. 9,600/- $\frac{9,600 \times 100}{50,000}$
Percentage of profit on sales : $\frac{9,600 \times 100}{50,000} = 19.2\%$

Percentage of profit on return: $\frac{9,600 \times 12 \times 100}{5,12,000} = 22.5\%$

XV. Break even point.

Fixed cost.

	Rs.
Rent	750·00
Interest	7,340
Insurance	500·00
Depreciation	4,270·00
40% salaries	5,360·00
40% other expenses	1,160·00
Total Rs. :	19,380·00

$\frac{\text{Fixed cost} \times 100}{19,380 \times 100}$

Fixed cost + profit : 28,980
Say : 66·8%

XVI. List of Machinery Suppliers.

1. M/s. Frances Klein & Co.
No. 1, India Exchange, Calcutta-1.
2. M/s. Batliboi & Co.,
Jeevan Vihar, Plt. Street, New Delhi.
3. M/s. Perfect Machine Tools (Pvt.) Ltd.,
Sir, P. M. Road, Fort, Bombay-1.
4. M/s. Kalsi Engg. Works,
Miller Gang, Ludhiana.
5. M/s. Quality Machine Tools,
J. C. Road, Bangalore.
6. M/s. Seigal Bros.,
Teliwara, Delhi.
7. M/s. Burma Mechanical Works,
Indl. Area, Ludhiana.
8. M/s. Indian Engineers,
Indl. Area 'B' Ludhiana.

XVII. Sources of Raw Materials.

1. M/s. Firth Sterling Steel Company of India Ltd.,
45/47, Apollo Street, Fort, Bombay-1.
2. M/s. Visvesvariah Iron & Steel Ltd.,
J. C. Road, Bangalore.
3. M/s. Hindustan Steel Ltd.,
Calcutta.

(Reserved item Sl. No. 411).

I. Introduction

(a) Hand numbering machine is a device used for rapid stamping or printing consecutive number of successive pages, sheets, or items. This numbering device is extensively used by book-binders, printers, offices, banks, etc.

(b) *Market Potential:* The demand for this item will increase in accordance with the increase of printing and binding units in the country. The demand for hand numbering machines is rated at 10 per cent increase every year.

II. Production Target: 6,000 Nos. hand-numbering machine per annum.

III. Production Detail and Process of Manufacture:

The proposed scheme envisages the manufacture of numbering machines for a production capacity of 500 Nos. per month.

The process involves, die casting of the body and also from pressed out components from steels sheets. The other parts are pressed out from M.S. sheets with the aid of different press tools. The numbering wheels are also either die cast or stamped and the figures are engraved. The numbering discs are assembled on to the body with the ratchet indexing mechanism. Few turned parts are made from capstan lathe, bench lathes, and drilling machines. Electroplating operations required is to be sub-contracted.

IV. Quality, Standards and Specifications:

There is no ISI standard available for this item and the quality of the product for performance have to be done with the manufacture of clear number impressions obtained.

V. Land & Building (Rented):

	Rs.
Covered area 200 sq. meters	500·00

VI. Machinery & Equipment :

	Rs.
1. Hot chamber pressure die casting machine pneumatically operated complete with compressor etc. 12 oz. capacity one	65,000·00
2. Power press column type geared cap. 40 tons one	25,000·00

		Rs.
3. Horizontal bench type milling machine 2 ft. bed hand operated	2 Nos.	20,000·00
4. Bench lathe 4" ht. of centre 3' bed, Gee-dee wieler or similar. Complete with collet outfit for 25 mm bar cap and chucking attachment	one	38,000·00
5. Centre lathe, ht. of centre 6½" 4' bed. Harihar-hicut or similar	one	38,000·00
6. Shaper 24" stroke geared type with enclosed motor etc.	one	20,000·00
7. Double ended bench grinder 8" wheel dia	one	1,200·00
8. Three dimensional pantograph engraving machine complete with circular engraving attachment. Tool craft of similar	one	45,000·00
9. Pillar drilling m/c 1" cap	one	1,000·00
10. Hand press No. 5	one	1,500·00
11. Bench capstan lathe collet to cap. 10mm complete with attachments. "Deem" or similar	one	20,000·00
12. Treadle guillotine shearing m/c. 48" × 16" swg. cap.	one	9,000·00
13. Installation charges		20,000·00
14. Dies jigs & fixtures		20,000·00
15. Work benches, assembly tables etc.		5,000·00
16. Office equipment & furniture		5,000·00
17. Measuring instruments & tools		5,000·00
		3,44,700·00

VII. (i) Raw Materials & Bought Out Components Per Month:

(1) CRCA sheets and M. S. sheet :0. tons @ Rs. 5000/- M tons.	2,500·00
(2) Zinc alloy L. M. G. @ Rs. 18,000 per ton 1/4 ton.	4,500·00
(3) Free cutting steel E.M.S. Rods. 200 Kg. @ 4000/M. Tons	400·00
(4) Spring steel wire. 50 kg. @ Rs. 9/ kg.	490·00
(5) Electroplating charges	500·00
(6) Screws, bakelite, knobs, ink pads, rivets (lumpsum)	100·00
	8,450·00

	Rs.
(ii) Indirect material	
Lubricants, cutting tools, cotton waste etc.	250.00
Total (i) & (ii)	8,700.00

VIII. Staff & Labour Per Month:

	Rs.
A. Administrative & Supervisory	
1. Manager one	750.00
2. Supervisor one	650.00
3. Clerk cum typist one	450.00
4. Storekeeper one	450.00
5. Chowkidar } Part time one	150.00
6. Peon } one	150.00
	2,600.00

B. Technical & others

	Rs.
1. Machine operators 9	3,600.00
2. Assemblers 3	1,200.00
3. Helpers one	200.00
4. Packers one	200.00
	5,200.00
Total A+B	7,800.00
Staff Welfare @ 30%	2,340.00
	10,140.00

IX. Other Expenses:

	Rs.
1. Power & water	300.00
2. Maintenance & repair	200.00
3. Printing & postage & stationery	100.00
4. Consumable stores	250.00
5. Advertisement & publicity	200.00
6. Packing expenses	150.00
7. Transportation charges	200.00
8. Taxes	150.00
9. Other miscellaneous	100.00
10. Rent	500.00
	2,150.00

X. Working Capital Per Month

1. Raw material	8,700.00
2. Personnel	10,140.00
3. Other expenses	2,150.00
	20,990.00

XI. Capital Investment:

	Rs.
1. Machinery & Equipment	344,700.00
2. Working capital for 3 months	62,970.00
	407,670.00

XII. Cost of Production/Month :

	Rs.
1. Recurring expenses	20,990.00
2. Insurance	200.00
3. Depreciation on machinery @10%	2,970.00
4. Interest on capital investment @15%	5,100.00
	29,260.00

XIII. Sales Proceeds/Month:

By selling 500 Hand numbering machines @ Rs. 70/-	35,000.00
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XI. Profitability Per Month:

Profit = Sales — Cost of production	
= 35,000 — 29,260 =	5,340.00

Percentage of profit on sales	$\frac{5340 \times 100}{35,000} = 16\%$
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Percentage of profit on return	$\frac{5340 \times 12 \times 100}{4,07,670} = 15.6\%$
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XV. Break Even Point

Fixed cost	
Rent	500.00
Interest	5,100.00
Insurance	200.00
Depreciation	2,970.00
40% salaries	4,050.00
40% other expenses	680.00
Say	13,500.00

Fixed cost $\times 100$	$\frac{13,500 \times 100}{18,840} = 71.6\%$
Fixed cost + profit	18,840

XVI. List of Machinery Suppliers

1. M/s. P. K. Industries, Industrial Estate, Aligarh (U.P.)
2. M/s. Batliboi & Co. Forbes Street, Fort, Bombay-1.
3. M/s. Perfect Machine Tools Pvt. Ltd., Bell Buildings, Sir P. M. Road, Bombay-1.
4. M/s. Voltas Ltd., Bombay.

XVII. Source of Raw Materials

1. M/s. Bombay Metals & Alloys Mfg. Co. Ltd., Reay Road, Bombay.

(Reserved Item Sl. No. 778)

I. Product and Its Uses:

Hair Pins/Grips are being used by ladies all over the world. Due to social uplift of villages, even the women folk in rural areas have started using this item extensively. Because of the item being so cheap, there is good market potential for this item :

II. Production Targets:

It is proposed to manufacture—

- (i) 6,000 Gross Hair Pins per month
- (ii) 10,000 Gross Hair Grips per month.

III. Production Details and Process of Manufacture:

The Hair Pin and Hair Grips are quite simple items to manufacture. These are made out of Spring wire of 16—18 gauge. The wire is led to the automatic machine where the pins/grips are formed to their final shape. After that these are painted by dipping in black paint and then baked in the Oven. The baked Hair Pins are finally packed in cartons of a dozen Pins each and marketed. In this Project, two automatic Hair Pins and Hair Grips making machines are provided, the capacity of each machine being 220 gross Hair Pins per day per shift and 400 Gross Hair Grips per day per shift. Hair Pins can be made out of HB Wire also but in this scheme it has been shown as made out of Spring Wire.

IV. Inspection and Quality Control:

There is no Indian or any other standard available for these items. However, the item is being produced in conventional sizes in inches. The usage of the item itself does not call for any rigid standards. Inspection of overall finish and some manufacturing defect is sufficient along with the proper quality of wire which should have spring action.

V. Land and Building :

Rs.

Covered Area 75 sq. meters
(Rented) 500.00

VI. Fixed Expenses :

(a) Machinery and Equipment

		Rs.
1. Automatic Hair Pin & Hair Grips making Machines 2-1/2" and 3" capacity complete with Dies, Electric Motor 2 HP, Starter, etc. 2		24,000.00
2. Bench Drilling Machine 1/2" capacity with Starter & 1/2 HP Motor 1		2,000.00
3. Painting Equipment i.e. Trays, Troughs, Drip Stands, Baking Oven, etc.		6,000.00
4. Installation & electrification etc.		2,400.00
5. Office Furniture & Equipment		1,600.00
6. Tools, etc.		1,000.00
Total		37,000.00

VII. Raw Material Requirements (per month) :

1. Spring Steel Wire 16-18 Gauge 5 Tonnes @ Rs. 7,000.-	35,000.00
2. Enamel Paint @ 7% of the Total weight of Hair Pins i.e. 350 Kg. @ Rs. per kg.	2,450.00
Total	37,450.00
Say	38,000.00

VIII. Staff and Labour (per month) :

1. Foreman 1	500.00
2. Skilled Workers 2	700.00
3. Unskilled workers 6	1,500.00
4. Accountant-cum-Clerk 1	350.00
5. Peon-cum-Chowkidar 1	250.00
Total	3,200.00

X. Other Expenses (per month) :	Rs.
1. Electricity & Water	205 .00
2. Tools & Dies	500 .00
3. Oil & Lubricants	200 .00
4. Postage & Stationery	100 .00
5. Packing Cartons 16,000 Gross	5,000 .00
6. Travelling & Transportation Expenses	2,400 .00
7. Rent	500 .00
8. Unforseen Expenses	275 .00
Total :	9,225 .00
Say :	9,300 .00

X. Working Capital Required for 3 Months :	
1. Raw Materials	1,14,000 .00
2. Salaries & Wages	9,900 .00
3. Other Expenses	27,900 .00
Total	1,51,800 .00
Say	1,52,000 .00

XI. Total Capital Investment :	
1. Fixed Capital on machinery & Equipment	37,000 .00
2. Working Capital for 3 months	1,52,00 .00
Total	1,89,000 .00
Say	1,90,000 .00

XII. Cost of Production (per month):	
1. Recurring Expenses	6,07,200 .00
2. Interest on Total capital @ 15%	18,350 .00
3. Depreciation on machinery @ 10%	3,700 .00
4. Sales Expenses	5,000 .00
Total	6,34,250 .00
Say	6,34,500 .00

XIII. Sale Proceeds (per annum) :	Rs.
1. By sale of 68,400 Gross Hair Pins (After allowing 5% rejections) @ Rs. 4/- per Gross	2,73,600 .00
2. By Sale of 1,14,000 Gross of Hair Grips @ Rs. 5/- per Gross	5,70,000 .00
Total	9,43,600 .00

XIV. Profitability (per annum) :

$$\text{Profit} = \text{Total Sales} - \text{Cost of Production}$$

$$8,43,600 - 6,34,500 = 2,09,100 \text{ .00}$$

$$\text{Say} = 2,09,000 \text{ .00}$$

$$\text{Percentage of profit on sales} = 24.7\%$$

XV. Break-Even Analysis :

$$\text{B.E.P.} = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Fixed Cost plus Profit}}$$

Fixed Cost (per annum) :

1. Rent	6,000 .00
2. Interest on Capital	18,350 .00
3. Depreciation on machinery	3,700 .00
4. 40% of salaries	15,840 .00
5. 40% of other expenses	44,640 .00
Total	88,530 .00
Say	88,500 .00

$$\text{B.E.P.} = \frac{88,500 \times 100}{2,97,530} = 20\% \text{ Approx.}$$

XVI. Names and Address of suppliers of Machinery :

M/s Indiana Trade Links, Sultanwind Road,
Near Octroi, Amritsar.

(Reserved item Sl. No. 493)

I. Product and Its Use:

HUB Cap is a cap used for covering the ends of the automobile hubs. It is made from M.S. sheet (22 SWG or similar) and pressed in such a way so as to fit it easily and correctly in the Hub. In some cases extra fixture is used to secure the fixing. It is available in the decorative colours and shades also.

II. Market Potential:

Now-a-days automobile engineering is progressing by leaps and bounds. Every year the production of automobile is going high and so the requirements of spares. Hub cap one of the fast moving item in the automobile spare line also.

III. Production Target:

Considering the market area over which a unit will have a good command at the initial stage, a production of 5000 pcs. of Hubs caps per month is envisaged in this scheme.

IV Production Details and Process of Manufacture:

The manufacturing process of Hubs caps is simple and the machinery used are indigenously available. M.S. sheet 16 SWG or similar are cut to the required circle, the desired shape and form is obtained by pressing operation and finally the edges are folded in the beading machine. The caps thus made are sent for the electroplating from outside unit.

Electroplating is a specialised job and it will not be economical for such a small scale units to do the same by himself at the beginning.

V. Inspection and Quality Control:

Normal control of dimensional accuracy is generally made for such an item with standard measuring tools and gauges. It should be free from any spot and should have a lustrous surface all over.

VI. Land and Building :

Rs. p.m.

1. Covered area—12m ² × 8m	Rented	300·00
---------------------------------------	--------	--------

VII. Machinery and Equipment :

		Rs.
1. Circle cutting machine power operated pedestal mounted upto 3'×16' SWG with 3/4 H.P. motor, starter and other fittings	1 no.	3,500·00
2. Double action Power ; press suitable for 16" circle 4" deep with 10 H.P. motor starter and other fittings.	1 no.	50,000·00
3. Hand operated Beading machine with rollers	1 no.	1,500·00
4. Die, punch & other Misc. hand tools and measuring tools.	L.S.	5,000·00
5. Installation & electrification & Furniture	L.S.	5,000·00
		65,000·00

VIII. Raw Material (Per Month)

1. M.S. sheet 22 SWG or similar for 5000 pcs	1·5MT	
	@ Rs.6600/-	
	per M.T.Rs.	9,900·00

IX. Staff and Labour (Per Month)

1. Supervisor	1 no.	500·00
2. Skilled operator	1 no.	300·00
3. Unskilled labour	4 nos.	1,000·00
4. Watchman	1 no.	200·00
Add labour benefit cost @ 10%		200·00
		2,200·00

X. Other Expenses (Per Month)

1. Rent	300·00
2. Electricity	250·00
3. Consumable tools, oils & lubricants etc.	400·00
4. Cartage & Freight	100·00
5. Packing & forwarding	300·00
6. Publicity	100·00
7. Maintenance	150·00
8. Sub-contract charges for electroplating	15,000·00
9. Sales expenses including travelling	300·00
10. Stationery, postage and insurance etc.	100·00
	17,000·00

XI. Working Capital (Per Month)

	Rs.
1. Raw material . . .	9,900·00
2. Staff & labour . . .	2,200·00
3. Other expenses . . .	17,000·00
	<u>29,000·00</u>

XII. Total Capital Investment :

1. Machinery & equipment . . .	65,000·00
2. Working capital or 3 months . . .	87,300·00
	<u>1,52,300·00</u>

XIII. Cost of Production (Per Annum)

1. Raw material . . .	1,18,800·00
2. Staff & Labour . . .	26,400·00
3. Other expenses . . .	2,08,000·00
4. Interest on capital investment @15% . . .	22,845·00
5. Depreciation on machinery & equipment @ 10% . . .	6,500·00
	<u>3,82,545·00</u>

XIV. Total Sales (Per Annum)

1. By sale of 57000 pcs of Hub caps . . . (considering 5% rejection)	@7·50 per pc. 4,27,500·00
2. By sale of scrap . . .	L.S. 2,500·00
	<u>Rs. 4,30,000·00</u>

XV. Profitability (Per Annum)

Total sale— . . .	4,30,000·00
Cost of production . . .	3,82,545·00
	<u>47,455·00</u>

$$1. \text{ Percentage of profit on sale— } \frac{47455 \times 100}{4,30,000} = 11\% \text{ approx.}$$

$$2. \text{ Percentage of return over capital investment— } \frac{47455 \times 100}{3,82,545} = 12\% \text{ approx.}$$

XVI. Break Even Point Analysis :

$$\text{BEP} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{annual profit}}$$

Annual Fixed Cost :

1. Rent . . .	3,600·00
2. Interest . . .	22,845·00
3. Depreciation on machinery & equipment . . .	6,500·00
4. 40% Salary . . .	10,560·00
5. 40% other expenses excluding the cost for sub-contract charges . . .	8,320·00
	<u>51,825·00</u>

$$\text{B.E.F.} = \frac{51825 \times 100}{51825 + 47455} = \frac{5182500}{99280} = 52\% \text{ approx.}$$

XVII. Name and Address of Machinery Supplier :

1. M/s Rama Industries, Rewari, Haryana.
2. M/s Atlas Works (P) Ltd., 119, Ripon St., Calcutta-16.
3. M/s Manaklal & Sons, 115/116, Narayan Dhuru St., Bombay-3.
4. M/s Batliboi & Co. Pvt. Ltd., Jeewan Vihar, Parliament St., New Delhi.

(Reserved item Sl. No. 629) ●●●●

I. Product and Its Uses

Lampholders, as the name implies hold electrical bulb at the same time the contact of the bulb circuit to terminals of electric mains. For the fixing of bulb, on the body of the holders slots are provided which are known as bayonet slots. The Lamp-holders generally available in the market are suitable for voltage not exceeding 250 volts and loading not exceeding two amperes. The item has been reserved for manufacturing exclusively in the small scale sector.

II. Market Potential

Electrification is being extended to rural areas. This will open a tremendous scope of marketing electrical items all over the country. For this reason production of this item in small scale will provide good scope of marketing with dispersal of industry. The demands in various growth points is expected to increase considerably in the next five years.

III. Production Target

In this profile, target of production is 6000 dozens per month on double shift basis.

IV. Production Details and Process of Manufacture:

In this profile, it is proposed to purchase brass components from small scale units such as the units existing at Jamnagar. With the help of hand operated moulding press under constant heat. The basic raw material used is phenol formaldehyde popularly known as bakelite. The moulded product is polished with the help of buffing machine. Then the brass components are fitted.

The equipment included in this profile is also suitable for production of other bakelite parts, such as switchcovers, plug covers etc.

V. Quality Control and Standards

The lamp holder should be manufactured and tested as per IS:1258-1967. The designations and dimensions prescribed in this standard correspond with those for lamp caps in IS: 418-1963 and IS: 897-1966.

For metric screw threads IS:4218-1967 is to be referred.

For the control of dimensions, specially as metal parts are to be purchased from outside, purchase of limit gauges are essential.

VI. Land and Building

	Rs.
100 sq. metre covered area to be rented @ Rs. 5/- per sq. metre per month	500.00

VII. Machinery and Equipment

(1) Bakelite hand-operated compression moulding machine with heaters	2 nos.	16,000.00
(2) Die (Moulds)	3 nos.	8,000.00
(3) 1/2" capacity drill machine	1 no.	1,000.00
(4) Buffing press/grinding machine, double ends with 2 HP motor	1 no.	2,000.00
(5) Testing equipments, tools, guages etc.		20,000.00
(6) Installation of machinery and electric connection		3,000.00
(7) Office furnitures		1,500.00
		51,500.00

VIII. Salaries and Wages (Per month)

(1) Supervisor—1 no. @ Rs. 400/-p.m.	400.00
(2) Operators—4nos. @ Rs. 300/-	1,200.00
(3) Helper—8nos. @ Rs. 150/-	1,200.00
(4) Clerk—1no. @ Rs. 300/-	300.00
(5) Watchman—1no. @ Rs. 200/-	200.00
(6) Part-time Sweeper—1no. @ Rs. 100/-	100.00
	3,400.00

IX. Raw Materials (Per Month)

(1) Bakelite powder 3 T. per month @ Rs. 1400/-	42,000.00
(2) Fix brass parts Rs. 3/- per dozen	18,000.00
(3) Inside brass ring Rs. 1.25 per dozen	7,500.00
	67,500.00

X. Other Expenses (Per Month)

	Rs.
(1) Rent	500· 00
(2) Power and Electricity	200· 00
(3) Maintenance and Repair	300· 00
(4) Packing and Forwarding	3000· 00
(5) Transport and conveyance	700· 00
(6) Post and Stationery	300· 00
(7) Miscellaneous expenses	1,000· 00
Total	6,000· 00

XI. Working capital (for 3 months)

	Rs.
(1) Raw material (Rs. 67,500 × 3)	2,02,500· 00
(2) Salaries & wages (Rs. 3400 × 3)	10,200· 00
(3) Other expenses (6000 × 3)	18,000· 00

XII. Total Investment

(1) Fixed Capital	51,500· 00
(2) Working Capital	2,30,700· 00
	2,82,200· 00

XIII. Cost of production (per month)

	Rs.
(1) Salaries & wages	3,400· 00
(2) Raw material	67,500· 00
(3) Other Expenses	6,000· 00
(4) Depreciation on Machinery @ 10% p.a.	430· 00
(5) Interest on total investment 15% P.A.	3,530· 00
	80,860· 00

XIV. Sales Proceeds (Per Month)

	Rs.
(1) 6000 Dozen @ 21—00	1,26,000· 00
(2) Less : 25% Salesman commission	31,500· 00
Total receipts	94,500· 00

XV. Profitability (Before Taxes)

	Rs.
(1) Total Receipts	94,500· 00
(2) Total Expenses	80,860· 00
Net Profit	13,640· 00

XVI. Indian Standard

The lamp holder should be manufactured and tested as per I.S 1258-1967 : Specification for Bayonet Lamp Holders.

XVII. Addresses of the machinery and raw material suppliers**(A) Moulding Press :**

- (1) Master Mechanical and Metal Pressing Works, 1415, G.B. Road, Bombay-64.
- (2) Lohar Mech. Engg. Works, 38, Khotwadi, 10th Lane, Bombay-4.
- (3) Kwalitiy Engg. Works, 48-A, Mukhtaram Babu Street, Calcutta-7.

(B) Other Machinery

- (1) M/s. Kala Machine Tools, No. 119, Shivaji Road, Shivaji Nagar, Bangalore-51.
- (2) M/s. Shubh Machinery Corporation, No. 15, Bank Street Bombay.

(C) Brass-Parts Suppliers.

- (1) M/s. Atul Brass Industries, 44, Digvijay Plot No. 44, Jamnagar.
- (2) M/s. Kiron Button Works, Kabir Para, Kiraniung, P. Box No. 15, Jamnagar.

(D) Bakelite Powder Suppliers

- (1) M/s. : Bakelite Hylam Limited, TIECION, 18, Dr. Mosses Road, Bombay-400004.
- (2) M/s. Indian Plastics Ltd., Poisar, Kandivali, Bombay-400067.
- (3) M/s. Gujarat Phenolic Synthetics (P) Ltd., Opp. G.S.F.C. Main Gate, Post-Fertilizer Nagar, Baroda-391750.

- (4) M/s. Daxxolite Plastics Ltd., Yeshkamal, Station Road, Baroda.

(E) Testing Equipments Suppliers.;

M/s. Bajaj Electrical Ltd., Instruments Division, Kothend, Poona.

M/s. Phillips India Ltd., Shivasagar Estate, Dr. A.B. Road, Bombay-400018.

(Reserved item Sl. No. 499)

A. Introduction

Apparatus for level measurement of levels falls into give main classes. (1) Mechanical (2) Pneumatic (3) Electrical, (4) Electronic and (5) Nuclear. The simplest example of the mechanical type is the ordinary level gauge glass. The second main class permits the level to be indicated or recorded at a point further removed from the liquid, and by the introduction of a system. The simplest form of level gauge consists of a vertical glass tube with float containing magnetic material.

Float Operated Dial Type

This type is adopted for use on small tanks and engine rooms. It is simple in principle consists of a float moving up and down with the liquid level at the end of a pivoted arms. The arm may be coupled directly by a suitable gear train to an instrument pointer rotates a driving magnet forming part of magnetic coupling. A mercury switch may be fitted on a potentiometer to give a control action and distance transmission. The range of this instrument is 0 to 6 under static pressure.

The choice of apparatus to test level, instruments on site or to arrive at data is governed to a large extent by the conditions and accordingly selections just be made the following.

- (1) Dip rod and tape (2) Hock gauge (3) Displacing by liquid measure (4) Displacement by weight (5) Displacement by positive type flow meter (6) Test gauge.

Hock Gauge: Consists of a tubular member carrying a scale and terminating in a small hook which a bracket projects. This is used to locate the gauge. The tip of which is a small circular disc of silver. The tubular member can be moved in a guide from which a bracket projects. This is used to locate the gauge. The vertical member is raised or lowered in its guide by rotating a milled head. The milled head is turned and the hook submerged with the tip pointing upstream if the water is flowing:

Self operating controller—Ball float valve: The ball float valve a control device. A valve seat usually with a composition disc is carried on a level

and aligned with a inlet orifice. The lever is raised or lowered by a ball floating. The value is of the balanced type.

Electric controllers: Works on a displacer pattern. The displacer is contained in a chamber of its own. It is suspended from one end of shaft, which passes through a horizontal bellows. The bellows act as a seal and pivoting means. The outside end of the shaft acts as a spring loaded pivoted beam, which carries a toothed quadrant wheel. The latter engages with a small gear wheel which drives a pointer over a scale against the torque due to flat coiled spring. The flat spring is pivoted and to its spindle, a small shaft is fixed, a shaft carrying a set of contacts engaging with either E or F fixed contacts. Circuits are closed to adjust the grid bias on a triode in the electronic controller. The electronic controller transmit appropriate signals to the electro pneumatic relays on the control valve. The arm operating the contacts also carries a moving coil acting in the field of a permanent magnet. The movement of the coil sets up a torque which opposes that due to the flat spring and circuit operation is continued until the two torques are equal. Then the contacts arm is in a central position between the two contacts and the action ceases. Any further movement of the displacer brings the tram of operation into being against necessitating a new balance.

B. Basis and presumptions

As explained above there are very many types and it is presumed that the indicating type moving circuit assembly etc. will be procured from outside and the floats of required design to be also sub-contracted in the scheme.

(ii) **Production capacity (Per annum):**—Different types of liquid level controllers 3500 nos. per year of a value of Rs. 2,70,000/-.

(iii) **Motive power required:** (Requirement of HP approx) 25 HP.

Financial aspects

- I. Land and building built up area —20' × 40' Sqt. (rented)

II. Machinery & equipment

		Rs.
1. 25 mm cap. Bar capstan lathe swing over bed 250 mm—Gee-Dee wiefer or sirmter	1 No	26,000·00
2. High precision drilling machine—Drilling cap. 3/4" spindle traverse 5", Dia of column 3"	1 No.	2,800·00
3. Hand lever operated milling machine working surface 650 mm—100 mm longitudinal movement of table—400 mm, vertical movement of table by rack 20 mm Range of spindle speed 360—1880 RPM		5,500·00
4. Double ended bench grinder 6" level dia	2 Nos.	1,800·00
5. Centre lathe all geared. Ht. of centre. 6" Ad- dission between Centres 2 Length of Bed—4 Ft. Harihar MDD-1 comp- late with accessories	1 No.	18,000·00
6. Instrument make lathe (watch maker) Height of centre 50 mm, Length of Bed 12". Complete with coliet outfit of dia. 0.5 to 6 mm LIENENWW 83 or similar complete with all attachments and accessories with milling attachment (imported)	1 No.	30,000·00
7. Assembly tools, wook benches		10,000·00
Measuring instrument and fixtures etc. (lump- sum)		
8. Glass graduating ap- paratus		5,000·00
9. Erection and installation charges		5,000·00
		<u>1,03,100·00</u>

2. Working capital (per month)

- (i) *Personnel :*
Administrative &
Supervisory :

		Rs.
Manager-cum-engineer	One	1,200·00
Foreman	One	800·00
Storekeeper-cum-typist	One	350·00
Inspector	One	400·00
		<u>2,750·00</u>

Technical, skilled & unskilled :

		Rs.
Skilled operators	3 Nos.	900·00
Skilled assemblers	3 Nos.	900·00
Unskilled workers	2 Nos.	300·00
Watchman	1 No.	150·00
Sweeper/Helper	1 No.	100·00
		<u>2,350·00</u>
Total salaries		<u>5,100·00</u>

(ii) Raw materials including packaging requirement/ PM;

Particulars	Indigenous/ Imported	Qnty.	Value	Rs.
Gauge glass tubes—				
Assorted	—			2,500·00
Ball floats of assorted sizes	—			1,500·00
Brass Rods—free cutting steels	—			500·00
Bellows, split, magnets (Lumpsum)				500·00
				<u>5,000·00</u>

(iii) Utilities (Per month)

	Rs.
Power and water	250·00

(iv) Other contingent expenses (per month)

	Rs.
Rent	600·00
Postage & stationery	200·00
Telephone	100·00
Consumable stores	3,000·00
Repair & Maintenance	150·00
Transport charges	100·00
Advertisement & Publi- city	300·00
Insurance	100·00
Taxes	150·00
Sales Expenses	200·00
Miscellaneous expenses	200·00
	<u>5,100·00</u>

(v) Total recurring expenses per month : (i)+(ii)+(iii)+(iv)	Rs.
	15,450·00
(vi) Total working capital (3 months basis)	46,350·00
3. Total Capital Investment :	Rs.
(i) Fixed capital	1,03,100·00
(ii) Working Capital (3 months)	46,350·00
	<u>1,49,450·00</u>
4. Cost of production (per year)	Rs.
Total recurring cost per year	1,85,400·00
Depreciation on machinery and Equipment at 10%	10,310·00
Interest on Total investment @ 15%	22,425·00
Total cost of production	<u>2,18,135·00</u>

5. Turnover (per year)

Items	Qty.	Rate/Unit	Value Rs.
1. Mechanical type ordinary graduated guage glass with magnetic float	1200	Rs. 25/-	30,000·00
2. Float operated dial type with dip rod;	600	Rs. 25/-	6,000·00
3. Hook gauge	1600	Rs. 100/-	1,60,000·00
4. Self operating controller with ball float valve	600	Rs. 150/-	90,000·00
5. Electronic control moving coil type	100	Rs. 200/-	20,000·00
			<u>2,70,000·00</u>
6. Net profit per year . (before income tax)			2,70,000·00
			<u>2,18,135·00</u>
			<u>51,875·00</u>

7. Net profit ratio :

$$\frac{\text{Net profit per year} \times 100}{\text{Turnover per year}} = \frac{51,875 \times 100}{2,18,135}$$

$$= 23.8\%$$

8. Rate of return :

$$\frac{\text{Net profit per year} \times 100}{\text{Total investment}} = \frac{51,875 \times 100}{1,49,450}$$

$$\text{Approx. } 34.8\%$$

9. Break-even point (% total production envisaged)

(i) Fixed Cost :

	Rs.
(a) Depreciation on machinery & Equipment	10,310·00
(b) Rent	7,200·00
(c) Interest on total investment	22,425·00
(d) Insurance	1,200·00
(e) 40% salary & Wages	24,480·00
(f) 40% other contingencies (excluding rent and insurance)	21,120·00
	<u>86,735·00</u>

$$\begin{aligned} \text{(ii) Net profit per year : } & 51,875 \cdot 00 \\ \text{BEP \% } & \frac{\text{FC} \times 100}{\text{FC} + \text{p}} = \frac{86,735 \times 100}{1,38,610} \\ & = 62.5\% \end{aligned}$$

10. *Additional information :* For setting up this industry process product design is necessary and also the product is made according to the application in a particular situation.

Skilled persons in this line will be necessary to undertake this work.

II. Addresses of machinery suppliers :

1. M/s. Voltas Ltd.,
Kasturba Road, Bangalore.
2. M/s. Perfect Machine Tools,
Bell Building, Ballard Estate,
Bombay-1.
3. M/s. Batlibio & Co.,
40, Forbes St., Fort, Bombay.
4. M/s. Relay Lienen,
Esslinges, West Germany.
5. M/s. Quality Machine Tools,
J.C. Road, Bangalore.

(Reserved item Sl. No. 791)

I. Product and its uses

These luggage carriers are fabricated from pipes and are fixed on the top of automobile cars to carry personal luggage. These luggage carriers are seen by us often on the top of cars carrying luggage.

II. Market Potential

Most of the car owners fix these luggage carriers to their cars. Further the replacement market is negligible. The market therefore is limited. But the machinery and equipments can be used for fabrication of other pipe structures and the products of the units can be increased in addition to luggage carriers. These carriers can be sold through motor spare parts dealers.

III. Production Target

It is proposed to manufacture 250 Nos. of luggage carriers per month in this unit.

IV. Production Details and Process of Manufacture

The tubes are cut to size with hand tools and bent to required shape in the pipe bending machine. Then they are placed in position and different members of luggage carriers are welded with the gas welding set. Then the luggage carrier is painted and despatched.

V. Inspection and Quality Control

The welding of various members of luggage carriers should be strong so that they will not give way when luggage is put within the luggage carrier. The painting should be done after proper cleaning. Then they are baked in a stoving chamber.

VI. Land and Building

Covered Area : 100 sq. meters (Rented) Rs. 50·000

VII. Machinery & Equipment

(1) Pipe bending machine	Rs.
1 1/4" capacity	1 No. 1,000·
(2) Gas welding set	1 No. 2,000·00
(3) Portable drill 13 mm with stand	1 No. 1,500·00

(4) Spry painting machine with gun compressor etc.	1 No.	Rs. 3,000·00
(5) Stoving chamber with air circulation (locally fabricated)	1 No.	4,000·00
(6) Hand tools, fixtures etc.		1,500·00
(7) Office furniture & equipments		2,000·00
(8) Installation and electrification		3,000·00
Total		18,000·00

VIII. Raw Materials (per month)

(1) M.S. Tubes 3/4" 2500 meters.	Rs. 17,500·00
(2) M.S. Sheet, plate, Nut bolt etc.	2,500·00
Total	20,000·00

IX. Staff and Labour (per month)

	Rs.
(1) Skilled workers	3 Nos. 1,200·00
(2) Semi-skilled workers	3 Nos. 750·00
(3) Unskilled workers	2 Nos. 400·00
(4) Office staff	3 Nos. 850·00
(5) Welfare facilities for staff and labour	500·00
Total	3,700·00

X. Other Expenses (per month)

	Rs.
(1) Rent	500·00
(2) Electricity and water	350·00
(3) Consumable tool	100·00
(4) Oil, lubricants and other consumable stores	500·00
(5) Cartage and freight	100·00
(6) Maintenance	100·00
(7) Publicity expenses	100·00
(8) Sales expenses, including travelling	800·00
(9) Stationery, Postage and misc. expenses	250·00
Total	2,800·00

XI. Working Capital (per month)

	Rs.
(1) Raw Material . . .	20,000·00
(2) Staff and labour . . .	3,700·00
(3) Other expenses . . .	2,800·00
Total . . .	26,500·00

XII. Total Capital Investment

	Rs.
(1) Machinery & equipment . . .	18,000·00
(2) Working capital for 3 months . . .	79,500·00
Total . . .	97,500·00

XIII. Manufacturing Cost (per month)

	Rs.
(1) Raw Material . . .	20,000·00
(2) Staff and labour . . .	3,700·00
(3) Other expenses . . .	2,800·00
(4) Depreciation on Machine equipment at 10% per annum . . .	150·00
(5) Interest on capital investment, at 15% . . .	1,218·00
Total . . .	27,868·00
Say . . .	27,900·00

XIV. Total Sales (per month)

	Rs.
By sale of 250 Carriers @Rs. 121/- per luggage carrier. . .	30,250·00

XV. Total Profit (per month)

Monthly profit = Total Sales per month—
Manufacturing cost per month.
= 30250 — 27900
= Rs. 2,350·00

Annual profit = 2350×12
= 28,200

(a) Percentage of profit on sales per month.
Profit per month

$$= \frac{\text{Profit per month}}{\text{Sales per month}} \times 100$$

$$= \frac{2350}{31250} \times 100$$

$$= 7.52\%$$

(b) Percentage of profit on capital investment.
Annual profit

$$= \frac{\text{Annual profit}}{\text{Total capital investment}} \times 100$$

$$= \frac{28200}{97500} \times 100$$

$$= 29.52\%$$

XVI. Break Even Analysis

$$\text{Break even percentage} = \frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100$$

Fixed cost per month :

	Rs.
(1) Rent . . .	500·00
(2) 40% of Staff and labour . . .	1,480·00
(3) 40% of other expenses excluding rent . . .	920·00
(4) Depreciation on machinery & equipment . . .	150·00
(5) Interest on capital investment . . .	1,218·00
	4,268·00
Say Rs.	4,270·00

$$\text{Annual fixed cost} = 4270 \times 12$$

$$= \text{Rs. } 51240·00$$

$$\text{Break even percentage} = \frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100$$

$$= \frac{51240}{51240 + 28200} \times 100$$

$$= \frac{51240 \times 28200}{51240} \times 100$$

$$= \frac{79440}{51240} \times 100$$

$$= 64.46\%$$

XVII. Name and Address of Suppliers of Machinery and Equipment

- (1) M/s. Hemco Corporation,
308, Bazar Gate, Street,
Behind Reserve Bank, Fort,
Bombay-1.
- (2) M/s. Machine Tools Traders (Madras),
P.B. No. 1260, 57-A, Linghi Chetty St.,
Madras-600001.
- (3) M/s. International Machine Tools Corporation,
5, Bank Street, Behind State Bank,
Fort,
Bombay-400023.

XVIII. Name and Address of Suppliers of Raw Materials

- (1) M/s. Suraj Metals,
46/48, Islampura Street,
Bombay-4.
- (2) M/s. Consolidated Steel Corporation,
30, Narayan Dhuru Street,
Bombay-3.
- (3) M/s. Central Tube & Hardware Mart,
55/57, Nagdevi Cross Lane,
Bombay-400003.

(Reserved item Sl. No. 634.)

I. Product and its uses

Cast Iron Man-hole covers are generally manufactured as per the specification laid down by the Indian Standard Institute for indigenous use. The foreign buyers have their own specification for this item. The item is used for sewerage and sanitary purposes.

II. Market Potential

The principal bulk indigenous users are C.P.W.D. State P.W.Ds. and Public Health Engineering Departments. Apart from this all State Housing Boards also purchase this item. With the present Govt. policy to provide more housing facility to the economically weaker section of the population, it is expected that the indigenous demand will grow up. There is good demand of man-hole covers in advanced countries like U.S.A., West Germany etc. Recently there is a spurt of orders from petro dollar countries also. The foreign buyers adhere to their own specification. Floor price of exportable C.I. Castings has been laid down by Export Promotion Council. As such, according to the specification of a particular country the price of the man-hole covers varies. This is a labour intensive industry and the demand of the item is increasing in foreign countries. For exporters of this item there is a cash incentive of 15 per cent on F.O.B. price in addition to duty draw back of Rs. 70/- per M.T. effective upto 31-3-1979.

III. Production Target

The installed capacity of the unit is 136 M.T. and the scheme envisages 75 per cent utilisation.

IV. Product details and process of manufacture

The following assumptions have been made to make the estimate as realistic as possible.

1. Electricity and water supply are available at the plant site.
2. Adequate transport facilities are available at the site.
3. The following expenses are indicative and varies according to local conditions.
 - (a) Labour and raw material costs.
 - (b) Distribution process and selling commission.
 - (c) Taxes, insurance & interest.

4. As mentioned earlier there are different specifications for the items for indigenous and foreign buyers. The present scheme has been drawn up on the basis of the general requirement of Arab Countries. The basic measurements of these castings are as under:

Type	Dimensions	Approx Wt.
Heavy	18"×24"	50 kg.
Medium	18"×24"	37 kg.
Light	18"×24"	22 kg.

The Scheme also envisages manufacture of man-hole covers for use in highways for which the additional testing facilities e.g. load testing device is essential. It may be pointed out that American buyers insist machining of the casting in certain cases. But the present scheme is made for non-machined castings.

Basic steps for manufacture

The man-hole covers are sand cast. The detailed operations that enter into the making of sand castings may be categorized as belonging to one of five fundamental steps of the process.

1. Pattern making (including core boxes).
2. Core making.
3. Moulding.
4. Melting and pouring.
5. Cleaning.

Pattern making: Patterns are required to make moulds. The mould is made by packing some readily formed plastic material such as moulding sand around the pattern. When the pattern is withdrawn, its imprint provides the mould cavity which is ultimately filled with metal to become the casting. Thus moulding requires first that patterns be made. If the casting is to be hollow, additional patterns, referred to as core boxes, are used to form the sand that is used to create these cavities.

Moulding: Moulding consists of all operations necessary to prepare a mould for receiving molten metal. Moulding usually implies ramming moulding sand around a pattern placed in a supporting frame, withdrawing the pattern to leave the mould cavity, setting of cores in the mould cavity, and the finishing and closing of the mould. The mould is then ready for pouring.

Melting and Pouring: The preparation of molten metal for casting referred to imply as 'melting'. Melting is usually done in a specifically designated area of the foundry, and the molten metal is transferred to the moulding area where the moulds are poured.

Steps in Cupola Operation: A cupola heat includes not only the actual melting operation but all the operations which precede and follow the period during which iron is being melted. A certain cycle of events occurs each time a heat is made, including the following:

1. Preparation of the refractory lining, bottom, and tap and holes.
2. Lighting and burning the coke bed.
3. Charging.
4. Melting.
 - (a) Starting the air blast
 - (b) Charging.
5. Tapping and slagging.
6. Dropping the bottom.

Each step above is an important one and must be properly carried out for a successful heat.

Fettling and Cleaning: Cleaning refers to all operations necessary to the removal of sand, scale and, excess metal from the casting. The casting is separated from the moulding sand and transported to the cleaning department. Burned on sand and scale are removed to improve the surface appearance of the casting. Excess metal in the form of fins, wires, parting line, and gates, is cut off.

V. Inspection and Quality Control

The man-hole covers are to be manufactured for indigenous use as per I.S. specification which are as follows:

1. IS-1726 (Part I to Part VII)
IS-1726 (Part-I), 1974, General requirement.
2. IS-1726 (Part II), 1974—Specific requirements of HD Circular type.
3. IS-1726 (Part-III), 1974—Specific requirements of HD double triangular type.
4. IS-1726 (Part IV), 1974—Specific requirements of MD Circular type.
5. IS-1726 Part V) 1974—Specific requirements of HD rectangular type.
6. IS-1726 (Part VI/Section I)
LD rectangular type, section I single seal.
7. IS-1726 (Part VI/Section 2)
LD rectangular type, section 2 double seal.
8. IS-1726 (Part VII/Section I)
LD square type, section I, single seal.

VI. Land and Building

1. 10,000 sq. ft. land @ 5 paise per sq. ft. Rented.
2. Covered area 3000 sq. ft. @ 30 paise per sq. ft. Rented.
3. Office building 400 sq. ft. @ 75 paise per sq. ft. Rented.

VII. Machinery and Equipment

1. Cupola 3 M.T. melting; capacity per hour having 5 : 1 Iron to coke ratio complete with suitable capacity bare shaft motor, including refractory lining, blower, steel connecting pipe & platform 60,000·00
2. Core & mould drying oven 10'×10'×6'—coal fired with blower & pyrometric attachment 20,000·00
3. 250 kg. Batch type motorised sand muller 20,000·00
4. Moulding tools, hand tools for fettling etc. 3,000·00
5. Laddles
 - 100 Kg. Cap. 2 Nos.
 - 50 Kg. Cap. 4 Nos. 3,000·00
 - 20 Kg. Cap. 4 Nos.
6. Moulding boxes of different sizes 4 M.T. 7,200·00
7. Flexible shaft grinder with 4" dia. 2 Nos. 2,000·00
8. Patterns L.S. 3,000·00
9. Weighing machine 500 Kg. Cap. 1 No. 2,800·00
10. Lifting & handling device 2,000·00
11. Drilling machine 1½" 3,000·00
12. Hydraulic load testing device 12,000·00
13. Misc. 1,000·00
14. Foundry Bed preparation 5,000·00
15. Sand sieves & wheel barrows (All prices inclusive of freight, octroi, surcharge etc.) 1,000·00

1,45,000·00

VII. (a) Other fixed expenses :

1. Office equipments 4,000·00
2. Installation & electrification 11,000·00
3. Pre-operative expenses 5,000·00

20,000·00

VIII. (1) Raw materials and consumable stores per month

1. Foundry Grade pig iron 50 M.T. @ Rs. 960/-per M.T.	48,000·00
2. 55 M.T. C.I. Scrap average price Rs. 900/- per M.T.	49,500·00
3. Coke 25 M.T. @ 450/- per M.T.	11,250·00
4. Coal 5 M.T. @ Rs. 200/-per M.T.	1,000·00
5. Plumbago, Beutonite, fire clay. etc.	1,000·00
6. Mould & Core sand . L.S.	500·00
7. Ferro alloys L.S.	500·00
8. Lime stone 6 M.T.	1,200·00
9. Misc.	1,000·00
	1,13,950·00

IX. Staff and labour/month

1. Manager	1 No.	1,000·00
2. Foreman	1 No.	600·00
3. Cupola attendant	2 Nos.	600·00
4. Skilled Moulder	10 Nos.	3,000·00
5. Core maker	2 Nos.	600·00
6. Accountant	1 No.	300·00
7. Typist/Clerk	2 Nos.	500·00
8. Godown keeper	1 No.	250·00
9. Watchman/Peon	4 Nos.	800·00
10. Fetter	2 Nos.	500·00
11. Machine Operator	1 No.	300·00
12. Unskilled worker	30 Nos.	4,500·00
13. Tech. assistant	1 No.	400·00
14. Internal Inspector	1 No.	400·00
		13,750·00

X. Other expenses (per month)

1. Rent	1,700·00
2. Electricity	600·00
3. Maintenance including pattern repair	700·00
4. Cartage & freight	3,000·00
5. Publicity	300·00
6. Painting	500·00
7. Travelling expenses	600·00
8. Testing charges	500·00
9. Stationery, postage, insurance, legal charges	700·00
10. Misc. expenses including office expenses	1,000·00
	9,600·00

XI. Recurring expenditure (per month)

1. Raw material & consumable stores	1,13,950·00
2. Staff & labour	13,750·00
3. Other expenses	9,600·00
	1,37,300·00

XII. Total Capital Investment

1. (a) Land & Building	Rented.
(b) Machinery & equipment	1,45,000·00
(c) Other fixed expenses	20,000·00
2. Working capital for 3 months	4,11,900·00
	5,76,900·00
Say Rs.	5,77,000·00

XIII. Cost of production (per annum)

1. Raw materials & con. Stores	13,67,400·00
2. Staff & Labour	1,65,000·00
3. Other expenses	1,15,200·00
4. Interest on capital @ 15%	86,550·00
5. Depreciation on Machinery @ 10%	14,500·00
	17,48,650·00

XIV. Total Sale (per annum)

1. By sale of 1140 M.T. of Man-hole Covers @ Rs. 1600/- per M.T.	18,24,000·00
2. Foundry Return 60 M.T. at the rate of Rs. 900/- per M.T.	54,000·00
	18,78,000·00

XV. Profitability (per annum)

Total sale—Cost of production=profit.	
Profit=18,78,000·00—17,48,650·00=1,29,350·00	
(a) Percentage of profit on sales	
$\frac{1,29,350 \times 100}{18,78,000} = 7\%$	
(b) Percentage of return over investment	
$\frac{1,29,350 \times 100}{5,77,000} = 22\%$	

XVI. Break Even Analysis

B.E.P. — $\frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Fixed Cost} + \text{Annual Profit}}$	
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Fixed Cost (per annum)

Rs.

1. Rent	20,400.00
2. Interest on non-recurring expenses @15%	24,750.00
3. Depreciation on machinery and equipment	14,500.00
4. Staff salary	51,000.00
5. Other fixed expenses	45,600.00
	1,56,250.00

$$\text{B.E.P.} = \frac{1,56,250.00 \times 100}{1,56,250 + 1,29,350} = 55\%$$

XVII. Foundry Equipment suppliers

1. Pioneer Equipment Co. (P) Ltd.,
432, Padra Road,
Baroda-390005.

2. Kulkarni Foundries Ltd.,
Hadapsar Industrial Estate,
Poona-411013.
3. The United Indian Engineers (P) Ltd.,
1/B, Convent Road, P.B. No. 11203,
Calcutta-14.
4. Bose & Co.
8, "S" Road, P. O. Dasnagar,
Howrah.
5. Satyanarayan Welding Works,
189/1, Belilious Road, Kadamtala,
Howrah.

Foundry requisites

1. M/s. K. K. Bose & Co.,
27/1B, Simla Road, Calcutta-6.
2. M/s. Hatim & Co.
90, Ripon Street, Calcutta-16.

Chaplets and Foundry Nails

M/s. Precision Metal Works Co.,
6/1, Clive Road, Calcutta-1.
(Reserved item Sl. No. 350)

I. Introduction

Measuring Chains or Surveying Chains is an important equipment used in survey work. This item is widely used as a kit of survey instruments by surveyors.

Normally sizes of 20-metres and 30 metres long chains are used in survey work.

II. Market Potential

There is a good demand for this item which is purchased by the Constructions, Land Survey, Government Organisations such as Survey of India, Defence Departments etc. They are procured as original equipment alongwith other survey equipment and also for replacement.

III. Production Target

6000 measuring chains per annum value Rs. 4,50,000.

IV. Production Detail and Process of Manufacture

Survey chains are measuring chains made out of Galvanised mild steel wire 4.00 mm (8 SWG) thick. They are also manufactured out of 9 and 10 SWG wires on special requirements. The item consists of the following parts:

(1) Handle (2) Eye Bolt and Collar (3) Ring, Link small and large (4) Tallies (5) Indicator ring (6) Arrows.

(1) *Handles* : Are made from Brass casting and well finished with swivelling movements at the eye bolt.

(2) *Eye Bolt & Collar* : Eye bolts are made of brass and collar fitter with handles are machined and smooth finished.

(3) *Ring, Small & Large links* : The links are made out of G.I. wire of 4 mm dia (8 swg) and so also the ring.

(4) *Tallies* : Tallies or indicators are punched out of thick brass sheet 1.5 mm to 2.00 mm thick.

(5) *Indicator ring* : A wire ring provided at every meter lengths made of Brass wire.

(6) *Arrows* : Made of G.I.M.S. wire of a set of ten numbers punched out and fitted to each chain.

(7) *Assy* : All the above parts are assembled and the chain is coated with oil and nicely tied in fine leather strap, wrapped in grease-resisting paper in a wooden case.

V. Quality Standards and Specifications

I.S. standard No. IS.: 1492-1959 may be followed for product standard and specifications.

On the handle, the length in meters must be engraved to indicate the length of the chain.

VI. Land and Building : (Rented)

	Rs.
Built up area 250 sq. meters	500.00

VII. Machinery and Equipment

(1) Power press—25 ton . one	20,000.00
(2) Rod Bending fixtures for cap upto 8 SWG . 8 Nos.	8,000.00
(3) Hand Fly Press No. 5 Two	3,000.00
(4) Pantograph engraving M/c Bench Model with ratio 1:1 to 1:25 "Bookanwala" or similar . One	10,000.00
(5) Horizontal milling M/c Model No. 1 'Kabi' or similar . One	30,000.00
(6) Centre lathe ht. of centre 4½"—3 ft. bed . One	28,000.00
(7) Double ended bench grinder 8" wheel dia . One	1,500.00
(8) Rod strengthening M/c for cap. up to 6 mm dia . One	6,000.00
(9) Bench drilling M/c ¾" cap. . One	3,000.00
(10) Hand tools, dies, jigs and fixtures .	5,000.00
(11) Gas welding set (Lump sum) .	1,500.00
(12) Office equipment, work tables, assy. tables, racks etc. .	6,000.00
(13) Installation and Erection charges .	7,000.00

1,29,000.00

VII. Raw Materials and Consumable Stores (Month)

	Kg.	Rs.
1. Galvanised M.S. wire 8,9, & 10 SWG	1600	7,500·00
2. Brass sheets 1·5 to 2 mm thick in shapes	100	3,000·00
3. Brass cast handles	200	4,000·00
4. Brass Cast Eye Bolts	100	2,000·00
5. Brass Rods 8 SWG	200	3,000·00
		<u>19,500·00</u>

(ii) Indirect materials

Lubricants, Cutting oils, Cotton wastes, cutting tools etc,	300·00
	<u>19,800·00</u>

VIII. Staff and Labour (Per Month)

A. Administrative and Supervisory:

	Rs.
1. Manager One	700·00
2. Inspector One	450·00
3. Ministerial staff 2 Nos.	800·00
4. Peon One	200·00
5. Chowkidar One	200·00
	<u>2,350·00</u>

B. Technical and others :

	Rs.
1. Machine operators 2 Nos.	800·00
2. Semi-skilled workers 6 Nos.	1,800·00
3. Helper One	200·00
4. Packer One	200·00
	<u>3,000·00</u>
Staff welfare @ 30%	1,605·00

IX. Other Expenses Total 6 955·00

	Rs.
1. Power and water	250·00
2. Maintenance & repairs	50·00
3. Printing and stationery & postage	100·00
4. Consumable stores	100·00

	Rs.
5. Advertisement	100·00
6. Packing expenses	300·00
7. Transportation charges	100·00
8. Taxes	50·00
9. Other miscellaneous	50·00
10. Rent	500·00
	<u>1,600·00</u>

X. Working Capital/Month

	Rs.
1. Raw material	19,800·00
2. Personnel	6,950·00
3. Other expenses	1,600·00
	<u>28,350·00</u>

XI. Capital Investment

	Rs.
1. Machinery & Equipment	1,29,000·00
2. Working capital for 3 months	85,050·00
	<u>2,14,050·00</u>

XII. Cost of Production per Month

	Rs.
1. Recurring Expenses	28,350·00
2. Insurance	100·00
3. Depreciation on machinery & equipment @ 10% (say)	1,075·00
4. Interest on capital investment @ 15% (say)	2,840·00
	<u>32,365·00</u>

XIII. Sales Proceeds

	Rs.
By sale 500 nos. of sizes @Rs. 75 per measuring chain	37,500·00

XIV. Profitability per month

Profit = Sales—Cost of production
 = Rs. 37,500 —32,365
 = Rs. 5,135

Percentage of Profit on Sales = $\frac{5,135 \times 100}{37,500}$
 = 13·7%

Percentage of Profit as total investment
 = $\frac{5,135 \times 12 \times 100}{2,14,050}$ = 28·7% (say)

XV. Breakeven Point

Fixed cost

Rent	500·00
Interest	2,840·00
Insurance	100·00
Depreciation	1,075·00
40% of salary (Say)	2,785·00
40% of other expenses	640·00
	7,940·00

Fixed Cost $\times 100$

$$\text{Fixed Cost} + \text{Profit} = \frac{7,940 \times 100}{1,5075} = 52.7\% \text{ (say)}$$

XVI. List of Machinery Suppliers

1. M/s. Perfect Machine tools,
Bell Buildings, Sir P. M. Road,
Bombay-1.
2. M/s. Batliboi & Co.,
"Jeevan Vihar", Parliament Street,
New Delhi-1.
3. M/s. Katbro Industries
Miller ganj, Ludhiana.
4. M/s. Maneklal & Sons,
115-16-Narayan Dhuru Street,
Fort, Bombay-1.
5. M/s. Quality Machine Tools,
J.C. Road, Bangalore.
6. M/s. G.R. Industries,
Jessore Road, Calcutta.

*(Reserved item Sl. No. 745)

I. Introduction

Modern mechanical type of toys have an increased attraction for inquisitive children and also with the increase in kindergarten schools, the sophisticated type of toys is the main attraction. Hence to development of mechanical toys of attractive designs will be evident.

Toys could be generally classified into the following groups:

(1) Wooden toys, (2) Plastic toys, (3) Mechanical toys.

The scheme deals with the group of mechanical toys and they depend upon the design and its purpose. They are sub-divided into:

(a) Dummy toys, (b) Spring driven or weight driven (fly-wheel type), (c) battery operated automatic toys.

Dummy Toys: That group of toys which cannot be made to move of their own with any built in mechanism. There are basic toys suitable for young child, display and show piece. These are either made from sheet-metal or die-casting of aluminium and zinc alloys and plastic.

Spring Driven Toys: This group is universally produced in large quantities and different varieties. The basic gear mechanism which operates different types of toys can be essentially the same for different toys. The only thing necessary is to create toy designs outer shape around this prime mechanism.

In this group a fly wheel instead of spring motive power can be provided.

Automatic Toys: Other could be provided a dry battery cell with a toy motor as motive power for the manufacture of mechanical toys. This scheme envisages the manufacture of mechanical toys of the above ranges.

Market Potential

Mechanical toy industry in India is of recent origin. During the short span of time this industry has made rapid strides and has grown in its stature in the industrial development of consumer industries and especially in the world of toys. With the rapid

development in science and education, the demand for sophisticated mechanical toys is increasing. With the rising trend in the standard of living of people in urban and rural areas, the demand for mechanical toys is growing at an accelerated rate.

II. Production Target

This scheme envisages the manufacture of mechanical toys such as automatic toys namely Drummer, Jet Plane, Lambretta Dolls, Cars, Trains, Aeroplanes, Joker Cycles, Space Helicopters, Police Tricycles, Scooter, Ambulance Car, Money Cycle, Vijayant Tank, Jeep, Chittaranjan Engines at the rate of 10,000 dozens/months.

III. Production Detail and Process of Manufacture

This could be divided into three major sections:

- (i) The body or outer shape
- (ii) The Prime Mechanism
- (iii) Assembly.

Bodies for different toys could be either made from sheet metal e.g. PCRC and tin plates, plastic moulded materials, generally injection moulded.

Spring operated prime mechanism consists of a few gears operated by a spring and the motion is transmitted. Through wire linkage other movements are obtained. Laminating round washer plates to form a small fly wheel can also be made by press work for hand operated toys.

Wheels and pinious are either blanked or made from extruded sections and turned on small capstan lathes. Generally the following process is involved.

1. Blanking and forming of sheets which are already offet colour printed profiles.
2. Wheels are blanked from PCRC sheets.
3. Pinious cone brass extruded sections and machine turned.
4. Flywheel plates are blanked and pierced on press.
5. The spring mechanism assembly.
6. Assembly of the body and mechanism.
7. Packing.

Rs.

IV. Quality, Standrad and Specifications

There are no standrad specifications. However, the quality of printing and the construction of the toys and the materials used should ensure the performance. The quality of packing must be attrative and good.

Rs.

V. Lard & Building (rented)

(300 sq. meters)

750·00

VI. Machinery/Equipment

1. Treadle operated Guillo-tine Shearing m/c 4 ft. length, 16 SWG cap	one	6,000·00
2. Bench type capstan lathe, length of bed—18" complete with collet out-fit 20mm bar cap	two	36,000·00
3. Centre lathe ht of centre 6½ Bed length—6 ft.	one	30,000·00
4. Power press—general type	one	25,000·00
5. Hand press No. 6	two	4,400·00
6. Hand press No. 5	5 nos.	10,000·00
7. Drilling m/c. ½" cap	1	4,000·00
8. Double ended bench grinder 8" wheel dia	one	1,300·00
9. Shaper—geared type ¼" stock	one	23,000·00
10. Horizontal milling m/c. bench type table length 24"	one	25,000·00
11. Wire straightening m/c.	one	4,000·00 25,000·00
12. Spray painting equipment with compressor	one	5,000·00
13. Hand lever Shear	one	2,000·00
14. Dies, Jigs & Fixtures		75,000·00
15. Work benches, tables and racks, etc.		10,000·00
16. Office equipment and work-shop furnitures		5,000·00
17. Installation charges.		10,000·00
		<u>2,75,700·00</u>

VII. Raw Materials and bought out components

1. PCRC and tin plate—½ ton @ Rs 36,000/ ton	18,000·00
2. Sub-contract charges of tin printing	500·00

3. Brass extruded charges for die cast toy bodies pinion sections @ Rs. 30/- per kg.	6,000·00
4. Spring steel strips hardened & in ribbon rolls—200 kg	1,000·00
5. Rubber moulded wheels	500·00
6. M S. wire—200 kg	2,000·00
7. Small Screws, Rivets	100·00
8. Paints, chemicals	500·00
9. Plastic moulded toy bodies	200·00
10. Lubricants, cutting oil, acids, cotton waste, cutting tolls etc	200·00
	<u>29,100·00</u>

VIII. Staff & Labour**A. Administrative & Supervisory**

1. Manager	one	750·00
2. Foreman	one	650·00
3. Ministerial staff	three	1,200·00
4. Peon	one	200·00
5. Chowkidar	one	200·00

B. Technical and others

1. Skilled operators	nos.	3,000·00
2. Semi-skilled workers	3 nos	1,200·00
3. Helpers	one	200·00
4. Packer	one	200·00
Staff welfare 30%		2,280·00
		<u>9,880·00</u>

IX. Other expenses

1. Electricity and water	400·00
2. Maintenance & repair	100·00
3. Printing, postage & publicity	250·00
4. Consumable stores	250·00
5. Advertisement & publicity	300·00
6. Packing Expenses	400·00
7. Transportation charges	200·00
8. Taxes	200·00
9. Other miscellaneous	200·00
10. Rent	750·00
	<u>3,050·00</u>

X. Working capital per month

	Rs.
1. Raw material	29,100· 00
2. Personnel	9,880· 00
3. Other expenses	3,050· 00
	42,030· 00

XI. Capital Investment

1. Machinery and equipment	2,75,700· 00
2. Working capital for 3 months	1,26,090· 00
	4,01,790· 00

XII. Cost of production per month

1. Recurring expenses	42,030· 00
2. Insurance	300· 00
3. Depreciation on m/cs @10 % (say)	2,290· 00
4. Interest on capital investment @15 %	5,025· 00
	49,645· 00

XIII. Sales proceeds

1. By sale of 800 dozens of mechanical toys such as toy cars, toy aeroplanes, Helicopters, moving cycles, etc. @Rs. 50/-	40,000· 00
2. By sale of automatic toys such as comet train, bijyant tank, police dept. car, Amt. Car, working dolls, drums, symboljokers @Rs. 100/- per 200 dozens.	20,000· 00
	60,000· 00

XIV. Profitability per month

Profit: Sales—cost of production :
Rs. 60,000—Rs. 49,645=Rs. 10,355/-

Percentage of profit on sales : 17· 25%

Percentage of profit on return : 30· 9%

XV. Break Even Point

Fixed cost

	Rs.
1. Rent	750· 00
2. Interest	5,025· 00
3. Insurance	300· 00
4. Depreciation	2,290· 00
5. 4 % of salaries	3,950· 00
6. 40 % of other expenses	1,220· 00
	13,535· 00

$$\frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{profit}} = \frac{13,535 \times 100}{23,890} = 56· 6\%$$

XVI. List of Machinery suppliers

1. M/s. Maneklal & Sons
Narayan Dhuru Street, Fort, Bombay-1.
2. M/s. Perfect Machine, Tools (Pvt.) Ltd.,
Bell Buidings, Sir P. M. Road, Bombay-1.
3. M/s. Batliboi & Co.,
Jeevan Vihar,, Parliament Street, New Delhi-1
4. M/s. Sagar Engg. Industries,
Miller Ganj, Ludhiana.
5. M/s. G. R. Industries,
Jessore Road, Calcutta.

XVII. Raw Material Suppliers

1. M/s. Bombay Metals & Alloys Mfg. Co.
Ltd., Reary Road, Bombay.
2. M/s. Metal Box Co. of India (for tin printing),
Bombay, Delhi, Madras branches.

(Reserved item Sl. No. 802)

I. Product and its uses

Meat and food safes are made of steel sheets and wire net so that cooked food, milk, meat etc. can be kept in the kitchen to safeguard them from cats, cockroaches, flies etc. Because of wire netting there will be free flow of air inside the safes. These safes find much use in kitchen where no cupboards are provided with wire netting.

II. Market potential

Meat and food safes are normally purchased by people who do not have proper storing facilities in kitchen. As these are cheaper than providing a cupboard in the kitchen, some prefer to keep these than having cupboards. There are limited demand for this item and the item will have selected customers who want to store the food preparation from health point of view.

III. Production Targets

It is proposed to manufacture 65 Nos. of meat safes of Galvanised sheets and 65 Nos. of meat safes of plain sheets with painting per month.

IV. Production Details and Process of Manufacture

The work involves mostly sheet metal work and as the gauge of sheet is very thin they can be worked with hand tools. The sheets are cut to different sizes as per requirement. The sides, top bottom back etc. are cut with scissors and fabricated with the help of rails, hammers etc. The portions where the wire netting are to be fixed are cut off from sides and front doors. Wherever necessary the rivetting is done. The hardware items like hinges etc. are fitted wherever necessary. The different portions of safe like sides, back, shelves etc. are fitted and meat safes made of B.P. Sheets are painted. The meat safes are made of folded construction for easy transport in dis-assembled condition. Normally the meat safe manufacturers prefer sheet scrap or cutting to virgin sheets to compete in tuff competitive market, virgin sheets can also be used when it is possible to get higher price.

V. Inspection and Quality Control

The safes should be manufactured in such a way so that there is no gap between sides, top, bottom etc. and these should have a good joint. This is necessary

not to allow cockroaches and other insects to enter. Similarly the wire netting should be properly fixed so that it does not give way and allow flies, mosquitos to enter the meat and food safes.

VI. Land & Building

	Rs.
Covered area 10 meters × 16 meters (Rented)	800.00

VII. Machinery & Equipment

Tin Smithy Hand tools such as rails, scissors, cutters, punches hammers mallets etc.	5 sets	5,000.00
Office Equipments		1,000.00
Total		6,000.00

VIII. Raw Materials (per month)

1. B. P./G. P. Sheet Scrap 24-26 gauge	2.34 M.T.	10,500.00
2. Purchased items like Fittings, wire nettings, paints, rivets etc.		4,300.00
Total		14,800.00

IX. Staff and Labour (per month)

1. Supervisor	1 @ 600/-	600.00
2. Semi-skilled workers	5 @ 250/-	1,250.00
3. Helpers	5 @ 200/-	1,000.00
4. Office Staff	1 @ 300/-	300.00
5. Labour amenities		315.00
		3,465.00

X. Other Expenses (per month)

1. Rent	800.00
2. Electricity and Water	100.00
3. Consumable tools, oils stores etc.	200.00
4. Cartage & freight	75.00
5. Packing cost	500.00
6. Publicity	175.00
7. Sales expenses & travelling	250.00
8. Stationery Postage & Misc.	200.00
Total	2,300.00

XI. Working Capital (per month)	Rs.
1. Raw Materials	14,800.00
2. Staff & Labour	3,465.00
3. Other expenses	2,300.00
Total	20,565.00

XII. Total capital Investments

1. Machinery & Equipment	6,000.00
Working capital for three month (Approx.)	62,000.00
Total	68,000.00

XIII. Manufacturing Cost (per month)

1. Raw Materials	14,800.00
2. Staff & Labour	3,465.00
3. Other expenses	2,300.00
4. Depreciation on machinery & equipment @20% per annum (Higher % provided as they are mostly tools)	100.00
5. Interest on capital @ investment @ 15% p.a.	850.00
Total	21,515.00

XIV. Total Sales (per month)

1. 65 Nos. of B. P. Sheets painted meat safes @Rs. 160/-each	10,400.00
2. 65 Nos. of G. P. Sheet. Meat safes @Rs. 200/-each	13,000.00
Total	23,400.00

XV. Total Profit (per month)

Profit = Total Sales — Manufacturing cost.
= 23,400.00 — 21,515.00 = 1885 or say 1900

(a) Percentage of profit on sales:

$$\frac{\text{Profit per month}}{\text{Sales per month}} \times 100$$

$$\frac{1900 \times 100}{23400}$$
= 8.12%

(b) Percentage of profit on investment:

$$\frac{\text{Profit per annum}}{\text{Total investment}} \times 100$$

$$\frac{1900 \times 12 \times 100}{68,000}$$
= 33.5%

XVI. Break Even Analysis

Break even percentage =

$$\frac{\text{Annual fixed cost}}{\text{annual fixed cost} + \text{Annual profit}} \times 100$$

Fixed cost per month	Rs.
1. Rent	800.00
2. 40% of Labour	1,360.00
3. 40% of other charges excluding rent	600.00
4. Depreciation on equipments	100.00
5. Interest on investment	850.00
Total	3,710.00

Annual fixed cost = Fixed cost per month × 12
= 3710 × 12
= 44520.00

Break Even percentage:

$$\frac{44520}{44520 + 1900 \times 12} \times 100$$

$$\frac{44520}{44520 + 22800} \times 100$$

$$\frac{44520}{67320} \times 100$$
= 66%

XVII. Name And Address as of Suppliers of Tools/ Equipments :

1. M/s. Tools Supplying Agency,
12, Mahalaksmi Nivas, S. V. Road,
BOMBAY-400067.
2. M/s. Satellite Commercial Co.,
153, Janjekar Street,
BOMBAY-400003.
3. M/s. Mehta Engineering Stores,
11, Industrial House,
51/53, Nagdevi X Lane,
BOMBAY-400003.

XVIII. Name and Address of Suppliers of Raw Material:

- 1 Any local sales office of Steel Authority of India Ltd.

(Reserved Item Sl. No. 366)

I. Product and its uses

(a) In this scientific age, microscopes have become an important tool in the field of general science, physics, chemistry, medicine and engineering. There are many varieties of Microscopes but student and medical types are used in large quantities in schools and hospitals respectively. There is a good scope of its manufacture. At the moment these types of microscopes are manufactured in Ambala and few scattered units make them at Delhi, Lucknow, Calcutta, Bombay and Masalipatnam (A.P.)

Market Potential

(b) There is a good indigenous market for the microscopes. Besides, there is also a vast export market which remains untapped. The main channels of marketing are either wholesale dealers in big cities or the Government agencies such as D.G.S.&D Controller of Stores in the states, Universities. Research Institutions, Private Schools, College and Institutions.

II. Basis and Presumptions

- (i) The basis for calculation of the production capacity is on single shift bases on 75 per cent efficiency.
- (ii) Pre-operative expenses indicated in the report include cost of the project preparation, non-refundable deposits and other expenses involved before production commences.
- (iii) The rate of interest in the scheme has been taken on the basis of 15 per cent at an average. However, this figure may be adjusted depending upon the conditions prevailing at the time of implementation of the project as well as location of the unit.
- (iv) The break-even point in the scheme has been calculated on the full capacity utilisation basis.
- (v) The cost of the machinery and equipment indicated in the scheme are approximately those prevailing at the time of the preparation of the report.
- (vi) The provisions made in respect of raw material, personnel, utility, over-heads etc. are drawn on the basis of standard operations and average out and the cost indicated against each

is approximate and based on local markets conditions and observations.

III. Technical Aspects**(I) Process outline**

The scheme envisages the production of microscopes of good quality according to I. S. Specification with the use of jigs, fixtures and gauges. There are two distinct elements involved in the microscope namely metallic part and optics. The present scheme involves the manufacture of technical parts alone and mounted optics will be obtained from their manufacturers. Other items to be procured as parts are mirrors, condenser lenses, rack and pinion set, mechanical stage and wooden case. The electroplating of parts will also be got done from the ancillary units.

For the purpose of calculations, only Student Microscope has been considered but Medical Microscope can also be manufactured with the same set of machines and equipments.

Raw material in the form of castings of cast iron, aluminium brass and rods and strips of brass will be taken and machined according to drawings/specifications of different components and assembled together. The boughtout components will also be assembled along with the made ones.

(i) Quality Specifications

I.S.I. has drawn the following standard specifications for different types of microscopes which may be followed by the entrepreneurs. The jigs, fixtures, gauges, instruments and special purpose mandrels/attachments will be needed for manufacture and testing the products to the desired accuracy as accepted by the national standards.

1. Student type Microscopes	IS	3686—1966
2. Pathological Microscopes	IS	5381—1967
3. Monocular dissecting Microscopes	IS	4328—1967
4. Measuring (Travelling Microscopes)	IS	4329—1967

5. Dimensions and marking of general purpose Micro scopes . . .	IS	3081—1965
6. General requirement for optical components . .	IS	988—1959
7. Glossary of terms used in optical technology .	IS	1399—1959
8. General requirements for optical instruments . .	IS	2754—1964
9. Research Microscope . .	IS	5204—1969

(iii) Production Capacity (per annum):

- (a) Quantity. . . . 120 Nos.
 (b) Value Rs. 660,000/-Approximately
 (iv) Motive Power (Requirement of H. P.)
 Approx. 20 H. P.

IV. Financial Aspects :

1. Fixed Capital

(i) Land and Building :

Land 300 sq. meters
 Built up area, office, stores etc. 50 sq. meters. Working shed 150 sq. meters.

Accommodation rented will be at an approximate rent-Rs. 300/-per month.

Note—The rates may be much less in smaller towns and industrially backward areas, suitable modifications in the final estimate will, therefore, be required to be made by the entrepreneur on the basis of the rates prevailing on the selected locations.

(ii) Machinery and Equipment:

(a) Production Unit

Sl. No.	Description	Indigenous/ Imported	Qty.	Price
1	2	3	4	5
				Rs.
1.	Heavy duty sliding, inrfacing and screwing lathe, geared head stock with quick change gear box complete with collect outfit. Length of bed 6" complete with motor (3 H.P.)	Indigenous	1 No.	15,000.00
2.	Capstan lathe (Ram type turret) with six positions tail stock and thread chasing attachment, Max. 1 1/2" complete with motor (3 HP)	Do.	1 No.	18,000.00
3.	Bench type lathe complete with Norton Gear Box length of bed 4 1/2" complete with motor (3H.p)	Do.	1 No.	6,500.00
4.	Vertical milling machine knee type, working cap. Table — size 36x8" complete with motor (3 HP)	Do.	1 No.	15,000.00
5.	Bench rinder Machine (double ended) 8-dia of grinding wheel with motor (1 H.P.)	Do.	1 No.	1,500.00
6.	Precision drilling machine 3/4" dia eap. complete with motor (1 HP)	Do.	1 No.	3,500.00
7.	Belt grinding and polishing machine complete with (1/2 HP) motor (to be fabricated locally)	Do.	1 No.	1,500.00
8.	Slotting machine for knurling complete with motor (1/2H.P) (to be fabricated locally).	Do.	1 No.	2,000.00
9.	Spray painting equipment with small compressor and motor (1 HP)	Do.	1 No.	4,000.00
10.	Hand tools such as vices, files	Do.	1 No.	3,000.00
				70,000.00
			C/O	70,000.00

1	2	3	4
(b) Testing equipment :			B/P 70,000·00
Such as micrometre, gauges, bevel protector, height gauge, trisquare, inspection gauges, mandrels, and other miscellaneous testing instruments			7,000·00
(c) Electrification and installation charges at the rate of 10 % of the cost of machines and equipment			7,000·00
Total cost of Machinery and equipment			84,000·00
(iii) Cost of jigs, fixture and special purpose attachments			8,000·00
(iv) Cost of office equipments such as office furniture, electric fans, store racks, working tables etc.			6,000·00
(v) Pre-operative expenses (Project cost—other nonrefundable deposits and expenses)			7,000·00
Total fixed capital (i)+(ii)+(iii)+(iv)+(v) =			1,05,000·00

2. Working capital (per month)

(i) Personnel

(Administrative & Supervisory)

Designation	No.	Salary	Total
		Rs.	Rs.
(i) Manager	1 No.	1,000·00	1,000·00
(ii) Storekeeper-cum-typist	1 No.	300·00	300·00
(iii) Accountant	1 No.	500·00	500·00
(iv) Peon	1 No.	200·00	200·00
(v) Watchman	1 No.	200·00	200·00
(vi) Sweeper (Part Time)	1 No.	50·00	50·00
			2,250·00
(Technical Skilled and Unskilled)			
(i) Foreman	1 No.	750·00	750·00
(ii) Inspector	1 No.	500·00	500·00
(iii) Skilled Workers	6 Nos.	400·00	24,00·00
(iv) Helpers	3 Nos.	200·00	600·00
			4,250·00
Total salaries			6,500·00
+Perquisites @ 15 % of salaries			975·00
Total			7,475·00

(ii) Raw materials including packaging requirements (per month)

Particulars	Indigenous/ Imported	Qty.	Rate	Value (Rs.)
1	2	3	4	5
(i) Cast Iron	Indigenous	200 Kg.	Rs. 3/-p Kg.	600·00
(ii) Aluminium Castings	Do.	150 Kg.	Rs. 18/-p Kg.	2,700·00
(iii) Brass and gun metal casting	Do.	180 Kg.	Rs. 22/-p Kg.	3,960·00
(iv) Brass rods, strips etc.	Do.	25 kg.	Rs. 27/- p Kg.	675·00
(v) Petty stores such as washers, screws, paints, packing materials etc.	Do.	—	—	1,500·00
				9,435·00

(II) Part to be procured from the ancillary units

	Nos.	Rs.
(i) Mirror	1000	600.00
(ii) Condenser lens	100	1,200.00
(iii) Reck and pinion set	100	1,200.00
(iv) Optics set	100	16,000.00
(v) Microscope case	100	3,500.00
(vi) Electroplating-wooden job work charge	100	500.00
		23,000.00

(iii) Utilities (per month)

Power 200 KWH Units @ 0.30 paise per unit Cost	600.00
Water 50 Kiloliters @ Re. 0.70 paise per KL	35.00

Total cost of Utilities

635.00

(iv) Other contingent Expenses (per month) Rs.

1. Rent	300.00
2. Postage and Stationery	100.00
3. Telephones	100.00
4. Consumable Stores	1,000.00
5. Repairs & Maintenance	400.00
6. Transport Charges	100.00
7. Advertisement & Publicity	200.00
8. Insurance	200.00
9. Taxes	100.00
10. Sale Expenses	250.00
11. Miscellaneous Expenditure	150.00
	2,900.00

(v) Total Recurring Expenditure
(per month) 43,445.00

(vi) Total Working Capital (on
3 month basis) 130,335.00

1,73,780.00

3. (i) Fixed Capital 1,05,000.00

(ii) Working Capital 1,30,335.00

Total (i)+(ii)

2,35,335.00

4. Cost of Production (per year) Rs.

(i) Total recurring cost per year	5,31,240.00
(ii) Depreciation on machinery & Equipment @ 10 %	8,400.00
(iii) Depreciation on jigs, fixture etc. @25%	2,400.00
(iv) Depreciation on office equipment @20%	1,200.00
(v) Interest on total investment @15%	35,240.00
Total cost of Production	5,78,240.00

5. Turnover (per year)

Student microscope =1200 Nos @ Rs. 550/-
Rs. 6,60,000.00

6. Net profit per year (Before Income Tax)

=Rs. 81,760.00

7. Net Profit Ratio =12.4% Approximately

8. Rate of Return =34.7% Approximately

9. Break even analysis

$$\text{B.F.P}\% = \frac{\text{Fixed Capital} \times 100}{\text{Fixed Capital} + \text{profit}} = \frac{1,00,300 \times 100}{1,00,300 + 61,760} = 55\% \text{ Approximately}$$

10. Addresses of Machinery and Equipment Suppliers :**(a) Milling Machines**

1. M/s B. S. Machine Tools Corpn.,
435, Jessore Road,
Calcutta.
2. M/s. Gilson Machine Tools, 523, Indl. Area, B,
Ludhiana.
3. M/s Prototype Production & Training Centre,
Okhla, New Dehi-20.

(b) Capstan Lathe

1. M/s Mysore Kirloskar Bros. Ltd.,
Yantrapur (Mysore).
2. M/s. New Bijli Foundry,
G. T. Road, Batla.
3. M/s. Achem Machine Tools Manufacturing Co.,
No. 167/1, Belilion Road,
Kadamatala, Howrah-1.

(c) Lathe

1. M/s. R. K. Machine Tools, Indl. Area -A,
Ludhiana.
2. M/s Chanana Bros., Okhla Industrial Estate,
New Delhi.
3. Prototype Production & Training Centre,
Okhla, New Delhi.
4. M/s. Machine Tools Prototype Factory,
Ambarnath.

(d) Drilling Machines

1. M/s. Prage Tools Corporation, Ltd., Secunderabad.
2. M/s Biridi Machine Works, G. T. Road, Ludhiana.

(e) Miscellaneous Hand Tools

1. M's. Batliboi & Co., Millerganj, G. T. Road, Ludhiana.
2. M/s Gedore Tools (P) Ltd., 131, Golf Links, New Delhi.

11. Address of Raw Materials Suppliers and Spares Suppliers :

(a) Objective and Eye Pieces

1. M/s. Harwin Optical & Glass Works, Hyderabad.
2. M/s. Accurex Optica Industries, Indl. Area, Jagadhri.
3. M/s. Towa Optics India (P) Ltd., Delhi
4. M/s. Andheri Sc. Co. Ltd., Masulipatam (AP).

5. M/s. National Instruments, Jadavpur (Calcutta).

6. M/s. Labo Optics, Panjabi Mohalla, Ambala Cantt.

(b) Mirror and Condensor Lenses

1. M/s. Prince Optical Works, Azad Market, Delhi.
2. M/s. Ambala Instruments, Sadar Bazar, Ambala Cantt.

(c) Rack and Pinion

1. M/s. Mukandi Lal & Sons, Nabha (Pb.)
2. M/s. Karam Egg. Works, Subzi Mandi, Ambala Cantt.

(c) Iris Diaphragm

1. M/s. Aplam Sc. Industries, Bengali Mohalla, Ambala Cantt.
2. M/s. Artex Equipment Co., Kacha Bazar, Ambala Cantt.

(Reserved item Sl. No. 787)

I. (a) Products and its use:

Pumps are required for lifting water in multi-storey buildings, room coolers, garden irrigation, fountains and cooling plants etc. Due to electrification programme construction activities in public and private sector, increased tempo of industrial expansion the demand of different types of lift pumps is increasing tremendously.

This scheme has been worked out for a small unit with an estimated capacity of 100 nos. water lifting pumps (1/20 to 1/30 HP AC 230 V) per month. With the machinery and equipments provided in this scheme the manufacturing of pumps of higher capacity may also be undertaken.

Indigenous technical know-how is available for the manufacture of all types of water lifting pumps. Machinery and equipments for production are also available from indigenous sources. The main raw material such as winding wires dynamo grade, silicon steel, insulating materials, ball bearings, die cast rotors etc., are indigenously available.

(b) Market Potential:

There is a growing need for the lift pumps required for normal lifting of water for domestic uses.

Power requirements : 5 KW 440 V.
3 phase AC

(c) Production Target:

This scheme envisages annual turnover of 12,000 no. of pumps @ Rs. 250/- per pump (average).

(d) Quality Control and Standards :

ISI has formulated standards for these pumps and IS : 1520-1972 specification has to be followed for maintained quality of the product.

II. Land and Building

Covered area of 200 sq. metres on rent Rs. 300.00

III. Plant and Machinery**(a) Machinery:**

		Rs.
1. S. S. & S. C. lathe with hollow spindle length of bed 1900 mm	1 No.	12,000.00
2. Grinding attachment for the above lathe	1 No.	1,500.00
3. Bench drilling machine $\frac{1}{2}$ " size	1 No.	1,500.00
4. Baking oven 2' x 2" Mtemp. upto 200° C. electrically operated with impregnating tank	1 No.	3,000.00
5. Coil Winding machine	1 No.	1,000.00
6. Hand press No. 6	1 No.	800.00
7. Double ended grinder 200 mm dia wheel	1 No.	1,200.00
8. Balancing equipment	1 No.	1,500.00
9. Compressor with spray gun	1 No.	3,000.00
10. Installation and electrification charges @ 10% of the total cost of machinery		2,500.00
		28,000.00

(b) Testing Equipment :

1. High voltage tester 0-3000 V.	1 No.	2,500.00
2. Wheatstone bridge with battery	1 No.	3,000.00
3. Insulation tester 0-500 V DC	1 No.	1,500.00
4. Amp. Meter. Voltmeter —LS. Water meter Techometer		1,500.00
5. Micrometer, Vernier, callipers, hand tools, soldering iron spanners, screw driver tools bits, Jigs, fixture, dies etc.		2,500.00

(c) Office Equipment & Furniture		3,000.00
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14,000.00

Total fixed capital (A ± B ± C) =

42,000.00

IV. Raw Material (Per month)

(Estimate of raw material required for one pump)

Cost per piece

Rs.

1. Aluminium Lm-C Cast trolley . 30·00
2. Stampings for sature and die cast rotor . 26·00
3. Super enamelled copper wire . 25·00
4. Ball bearings . 25·00
5. Shaft for rotor . 5·00
6. Brass Impeller & leg . 37·00
7. Capacitor g . 5·00
8. Aluminium Cast fan . 3·00
9. Paint . 5·00
10. Hardware items such as screw nuts, washers etc. . 4·00
11. Insulation materials . 5·00

170·00

Total raw material required for 100 nos. of pumps=
 $170 \times 100 = 17,000·00$

V. Staff and Labour (Per month)

Rs.

1. Foreman-cum-manager 1 No. 550·00
2. Skilled worker 2 Nos. 600·00
3. Semi-skilled worker 2 Nos. 400·00
4. Clerk/typist 1 No. 250·00
5. Chowkidar 1 No. 150·00

1,950·00

VI. Other Expenses (Per month)

Rs.

1. Electricity, water, telephone etc. 250·00
2. Postage, stationery & packing 200·00
3. Advertisement etc. 200·00
4. Repairs and replacement of machine 100·00

75·00

VII. Working Capital (Per month)

Rs.

1. Raw materials 17,000·00
2. Staff and Labour 1,950·00
3. Other Expenses 750·00
4. Rent 300·00

20,000·00

VIII. Total Capital Investment

Rs.

1. Fixed Capital 42,000·00
 2. Working Capital for three months 60,000·00
- 1,02,000·00

IX. Cost of Production (Per month)

1. Working Capital (Per Month) Rs. 20,000·00
15%
 2. Interst on capital investment 15% 1,275·00
 3. Dep. on machinery & equipment @10% 350·00
- 21,625·00

X. Return By sale (Per Month)

Rs.

1,000 Nos. water lifting pumps @ Rs. 250 -
per pump (average cost) 25,000·00

XI. Profitability Rs. 25,000/- Rs. 21,2625=

Rs. 3,375·00.

Profit on sales $3375 \times 100 = 13·5\%$

$\frac{25,000}{102000} = 12 \times 3375 \times 100 = 29\%$
Profit on investment

XII. Break Even Point s

$\frac{\text{Fixed cost} \times 100}{\text{F.C.} + \text{Profits}} = \frac{2305}{2305 + 3375} = 5680 = 40·8\%$

XIII. Address of Machinery Suppliers

1. M/s. Rajesh Machines Tools, Lathe
P.B. No. 17,
Ghogha Gate, Bhavnagar-1.
2. M/s Gurunanak Engineering works Do.
Kahnuwan Road. Sinbala,
Batala (Pb.)
3. M/s United Machine Tools Corpn. Do.
No. 12 DLF Indl. Area,
Najafgarh Road,
New Delhi—15
4. M/s Globe Engineering Co. Bench
2524, Shardhanand Marg, Grinder
Delhi-6.
5. M/s Pilot Engineering Works, Do.
Opp. Goregaon Talkies.,
Goregaon,
Bombay.

- | | | |
|---|----------|--|
| 6. M/s Industrial Engg. Works.,
(Comvili unit No. 38
Police Court Lane,
Bombay-18. | Furnaces | 9. M/s Ameteeep Machine Tolls (P) Ltd., Presses
Faridabad (Pb). |
| 7. M/s Precision Control,
Plot No. 20 SIDCO,
Indl. Estate Ambattur,
Madras-98. | Do. | 10 M/s Satisfield Equipment (P) Ltd.,
Plot No. 3 Survey No. 132 Ganesh
Hind Road,
Poona-411007. |
| 8. M/s Prem Engineering Works,
Okhla Indl. Estate.
Okhla,
New Delhi. | Presses | 11. M/s Metallizing Equipment Co.
5th Chospasani Road,
Jodhpur (Rajashthan) |

I. Product and its Uses

M.S. (Mild Steel) and C. I. (Cast iron) Flanges are very important items of pipe line fitting. These are used for the purpose of jointing various lengths of pipes. Flanges are fitted at the ends of each pipe length to facilitate it being jointed with the next length of pipe so that continuous running of a pipe-line for the flow of liquid or gas is possible.

II. Market Potential

Wherever any flow of liquid or gas is required installation of a pipe line is a must to carry the liquid or gas from its point of generation to the point of consumption or utilisation. They are required for both industrial purposes and domestic consumption. With the growth of industrialisation and a programme of progressive increase in public amenities by the welfare state of ours, requirement of pipe fittings like M. S. and C. I. flanges is also increasing. Hence there is a good market for this item of product. It is needless to mention that pipe-lines as a whole or section after section requires periodical replacement owing to their corrosion, rusting and damage in one way or other. This necessitates requirement of replacement of flanges also. As such the market demand for this item is quite steady and growing. Apart from the domestic market which is already vast considering the vastness of this country. There is also a good export market for this item. Along with other engineering goods made in India pipe flanges are also having an event expanding export market not only to the developing countries but also to a number of developed countries who are purchasing these simple items from India more and more possibly to divert their own capacity to the manufacture of more sophisticated items. Hence for years to come there is almost an assured market for this item of product.

III. Production Target

It is proposed to have the following product mix in the monthly production programme of the unit.

Finished M. S. Flanges	—6.4 M. T.
Finished C. I. Flanges	—3.0 M. T.

IV. Product Details and Process of Manufacture

Flange is a fitting of cylindrical shape with a flat ring at one end at 90° as integral part of it.

While the inside of the cylinder is threaded to be fixed with the threaded pipe ends, there are a number of holes in the flat ring portion to fix the same with the corresponding flange of the next pipe section. The radial distance of the centres of the holes and their spacings should be the same for all the flanges of similar size. The dimensions are guided by ISI specifications.

There is slight difference in the process of manufacture between M. S. Flanges and C. I. Flanges. While in case of C.I. Flanges the casting of proper shape and size with some machining allowances is available from the casting units on order, in case of M. S. flanges the blanks of the flanges are to be made in the unit itself. Machining operation is same in case of both M. S. and C. I. flanges. It is machined on a lathe where turning, facing, boring and inside threading operations are done. Then drilling is done on a Drilling Machine either by having marking on it or with the aid of a drilling jig where quantum of production is sufficiently high. For quick marking templates can be used.

V. Inspection and Quality Control

The items are referred by I.S.I. specification which are as follows:

For M. S. Flanges I. S. 6392
For C. I. Flanges I. S. 6418

The item is manufactured in fairly large size of lots. Proper inspection at stages of operation to control its standard of quality is desirable to avoid rejection of finished item. Dimensional accuracy to the specified limits and tolerances can be assured by way of using "go", "no go" and other suitable gauges.

VI. Land and Building

Office and workshop covered area 200 sq. met. er rented @ Rs. 750/- per month.

VII. Machinery and Equipment

		Rs
1. Lathe 6'0" bed heavy duty with standard accessories Motor, starter and electricals.	2 Nos.	32,000.00

		Rs.
2. Lathe 4'-6" bed (Medium) with standard accessories, Motor, starter and electricals	3 Nos.	30,000· 00
3. Drilling Machine 1" capacity Motorised with all standard accessories and Electricals	3 Nos.	6,000· 00
4. Power Press 80 Ton capacity with 10 HP Motor and Electricals	1 No.	30,000· 00
5. Double ended grinding machine motorised with I H. P. Motor along with Electricals	1 No.	1,200· 00
6. Oxy. Acetylene Gas cutting set	1 set	1,200· 00
7. Electric welding set 300 Ampere capacity	1 set	3,200· 00
8. Hand Shearing Machine	1	400· 00
9. Tools, Jig, Fixture, Blacksmithy hearth & Blower etc.		3,000· 00
10. Installation and Electrification.		8,000· 00
11. Furniture, Fixture including office equipment type-writer etc.		5,000· 00
		<u>1,20,000· 00</u>
		Rs.
VIII. Raw Material (Per Month)		
1. M/s. plates in various thickness 6mm to 25 mm—8 metric Tons @ Rs. 2,250/- per M.T.		18,000· 00
2. Cost of Welding Electrodes gas including rental for cylinders		2,000· 00
3. C.I. castings 4 M.T. @ Rs. 2,500/- per M.T.		10,000· 00
		<u>30,000· 00</u>
IX. Staff and Labour (Per Month)		
		Rs.
1. Works Manager	1	800· 00
2. Foreman/Supervisor	1	600· 00
3. Office/Assistant-cum-typist	1	300· 00
4. Skilled Operators	5	2,000· 00
5. Semi-Skilled workers	2	500· 00
6. Unskilled labour	3	600· 00
7. Peon-cum-watchman	1	200· 00
		<u>4,600· 00</u>
Cast of Labour Benifits @ 10%		460· 00
		<u>5,060· 00</u>

	Rs.
X. Other Expenses (Per Month)	
1. Rent	750· 00
2. Electricity	500· 00
3. Consumable tools, oils, lubricants and other consumable stores	500· 00
4. Coal	400· 00
5. Maintenance	150· 00
6. Cartage & freight	300· 00
7. Packing cost	400· 00
8. Publicity	400· 00
9. Selling expenditure including travelling	300· 00
10. Stationery, Postage, Insurance, Legal charges, fees, licences and other miscellaneous expenses	300· 00
	<u>4,000· 00</u>

	Rs.
XI. Working Capital Required (Per Month)	
1. Raw material	30,000· 00
2. Staff & Labour	5,060· 00
3. Other Expenses	4,000· 00
	<u>39,060· 00</u>

	Rs.
XII. Total Capital Investment	
1. Machinery & Equipment	1,20,000· 00
2. Working capital for 3 months	1,17,180· 00
	<u>2,37,180· 00</u>

	Rs.
XIII. Cost of Production (Per Annum)	
1. Raw Material	3,60,000· 00
2. Staff & Labour	60,720· 00
3. Other Expenses	48,000· 00
4. Interest on capital @15%	35,577· 00
5. Depreciation on Machinery @10%	12,000· 00
	<u>5,16,297· 00</u>

	Rs.
XIV. Total Sale (Per Annum)	
By sale of	
1. Finished M. S. flanges 76" 8 M. T. @Rs. 4·85/Kg.	3,72,480· 00
2. M. S. scrap available for sale 19·2 M. T. L. S.	12,000· 00
3. Finished C. I. flanges 36" M. T. @ Rs. 4·85/Kg.	1,74,600· 00
4. C. I. scrap available for sale 8 M. T. L. S.	6,000· 00
	<u>5,65,080· 00</u>

XV. Profitability (Per Annum) .

Total sale—cost of Production⇒Profit
Profit=Rs. 5,65,080—Rs. 5,16,297=Rs. 48,783·00

(a) Percentage of Profit on sale
$$\frac{48,783 \times 100}{5,65,080} = 9\% \text{ approx.}$$

(b) Percentage or return over investment
$$\frac{48,783 \times 100}{2,37,180} = 20\cdot 5\% \text{ approx.}$$

XVI. Break Even Analysis

B. E. P.
$$\frac{\text{Annual Fixed cost} \times 100}{(\text{Annual Fixed cost} \times \text{Annual Profit})}$$

	Fixed cost (per annum)	Rs.
1. Rent		9,000·00
2. Interest		35,577·00
3. Depreciation M/c & equipment		12,000·00
4. 40% of salaries		24,288·00

5. 40% of other expenses (excluding Rent)	Rs 15,600·00
	96,465·00

B. E. P.
$$= \frac{96,465 \times 100}{(96,465 + 48,783)} = 66\% \text{ approx.}$$

XVII. Name and Addresses of Machinery Suppliers

1. M/s. Power Tools & Appliances Co. 2, B. B. D. Bagh (East), Calcutta-700001	Lathe grinder
2. M/s. Vivekananda Engineering works, 12C Deshapran, Sasmal Road, Howrah-1	Do.
3. M/s. Leading Engg. Works, 31, Rohtak Road, New Delhi.	Do.
4. M/s. Rajesh Machine Tools, Post Box No. 17, Ghogha Gate, Bombay-1	Do
5. M/s. Kala Machine Tools, No. 119, Shivaji Nagar, Bangalore-51	Drilling Machine.
6. M/s. Atlas works (P) Ltd., 119, Ripon Street, Calcutta-16.	Power Press
7. M/s. Weldmaster Electrical Co. (India) Weldmaster House, Church Road, Kashmere Gate, Delhi.	Welding set

(Reserved item Sl. No. 355)

I. Product and its Uses

This project profile deals with the manufacture of M. S. Sockets used on water pipes. The maximum size which can be manufactured under this scheme is 100 mm. dia.

II. Production Target

The project has been formulated to manufacture 1,20,000 sockets per annum.

III. Market Potential

There is substantial market for M. S. pipe fittings all over the country, because of the priority given for the provision of drinking water facilities to even the remotest villages by the Government.

IV. Production Details and Process of Manufacture

1. Cutting the sheet to sizes.
2. First bend to U-shape.
3. Second bend complete ring.
4. Welding the joint.
5. Rough turning O. D. & facing.
6. Hot dip Galvanising.
7. Boring inside dia.
8. Internal Threading.
9. Finish Tapping.
10. Packing.

V. Land & Building

Total area of about 1,500 sq. mtrs. is required for the project, out of which about 400sq.mts. will be covered and rest open. $\int$ Cost Rs. 15 lakhs.

VI. Machinery & Equipment

(a) Production Machines and other fixed assets

S. No.	Name of machine	Qty.	Approx cost (Rs.)
1	2	3	4
1.	Guillotine machine	Treadle Shearing type—	
		1 no.	10,000·00
	1250 Csm		

1	2	3	4
2.	Hand operated shearing machine 12" size	1 no.	1,000·00
3.	Power Press—75 Tons cap.	1 no.	20,000·00
4.	Power Press—50 Tons cap.	1 no.	15,000·00
5.	Electric Welding Transformers 500 Amps.	2 nos.	6,000·00
6.	Special purpose production lathes 3' size	6 nos.	24,000·00
7.	Tapping machines upto 4" dia	2 nos.	12,000·00
8.	Galvanising tank for Hot dip galvanising	1 set.	8,000·00
9.	Dies and Tools etc.		3,000·00
			99,000·00

(b) Inspection & Quality Control Equipment:—Rs.

1.	Vernier Calipers, Micrometers, Thread pitch gauges etc.	4,000·00
2.	Thread plug gauges for pipe threads 25 mm. size to 100 mm size	10,000·00
		14,000·00

(c) Other fixed assets:—

1.	Office furniture	1,000·00
2.	Typewriter	2,000·00
3.	Fans	1,200·00
4.	Scooter	5,000·00
		9,200·00

(d) Installation charges

Total of (a), (b), (c) & (d) 1,31,800·00

VII. Raw Materials per Month

Rs.

4.	M. S. Sheet plate skelp from 14 gauge to 8mm thick @ average 350 gms. per piece for 10,000 pcs.	3·5 M. Tons.	14,000·00
2.	Zinc @5% of the Wt. of finished Sockets @Rs. 22/- per kg.	150 kgs.	3,300·00
			17,300·00

VIII. Staff/Labour

		Rs.
1. Manager	1	750·00
2. Suprvisor	1	500·00
3. Skilled workers	7 @Rs 300/-	2,100·00
4. Helpers	4 @Rs. 200/-	800·00
5. Part time clerk cum- Accountant	1	200·00
6. Peon-cum-Chowkidar	1	200·00
Total		<u>4,550·00</u>

IX. Other Expenses

	Rs.
1. Electricity & water (30 H.P.)	600
2. Fuel (coal)	2,000
3. Transport & cartage	400
4. Consumbles, i.e. oils, lubricants. cotton waste etc	
5. Tool bits & electrodes	500
6. Stationery & postage	800
7. Miscellaneous	200
	500
	<u>5,000</u>

X. Working Capital For 3 Month

	Rs
1. Raw materials	51,900
2. Staff & labour	13,600
3. Other expenses	15,000
	<u>80,500</u>

XI. Total Capital Investment

1. Land & Building	1,50,000
2. Machinery & other fixed assets	1,31,800
3. Working capital for 3 months	80,500
Total	<u>3,62,300</u>

XII. Cost of Production Per year

	Rs.
1. Raw materials	2,07,600
2. Staff & Labour	54,400
3. Other expenses	45,000
4. Interest on total capital @15% per annum	50,680
5. Depreciation on machinery & equipment @10 % per annum	9,600
6. Depreciation on building @5% per annum	6,000
7. Sales expenses @ 5%	18,000
Total	<u>3,91,280</u>
Say	<u>3,91,300</u>

XIII. Sales realisation

By sale of 120,000 Sockets	Rs.
@ Rs. 4 per piece average.	4,80,00

XIV. Profitability.

Sales minus cost of production = Profit.

i.e. Rs. 4,80,000—Rs. 3,91,300=Rs. 88,700/-

Percentage of profit on sales =19%

Return on capital investment =25% approx.

XV. Break Even Analysis.

Annual Fixed Cost × 100
B.E.P. = <u>Annual Sales—Annual Vairable Cost.</u>
94.200 × 100
<u>4,80,000—2,97,000</u>
=51 %

XVI. Address of Machinery Suppliers.

- M/s. Moudgil Industries
G. T. Road, Batala. Guillotine shear-
ing Machine.
- M's. Parmar & Sons. 95, -do-
Parmar House, 5th
Kumbharwada BOM-
BAY-4.
- M/s. Burma Mechani- Power Presses
cal Works,
258, Industrial Area A,
LUDHIANA.
- M/s. Prem EGINEERING -do-
Works 32, Okhla In-
dusirial Estate,
NEW— DELHI.
- M/s. Industrial Gas Ltd. Welding Trans-
138, Canning Street, CAL- formers.
CUTTA.
- M/s. Jaimal Mechanical Special purpose
Works Jaimal Road, lathes & Tapping
Janta Nagar., Machines.
Industrial Area-B
LUDHIANA.
- M/s. Remit Manufactu- -do-
ring Co. Ltd. Block
II (2nd floor),
Cadell Road,
BOMBAY.

(Reserved item S. No. 378)

I. Products and its Uses

(a) Oil crusher is utilised for extracting oil from various seeds such as groundnuts, coconut, til, castor oil, rai, mustard, watermelon, tumba, rapeseed, etc.

(b) Due to rapid growth of agriculture there is growing need for crusher for extracting edible and non-edible oils. A number of variety of oil seeds are collected as forest produce and it is necessary to have small capacity oil crushers to extract oil in rural areas.

II. Production Target :

It is proposed to manufacture 25 oil crushers and parts equivalent to 5 crushers per annum. This scheme envisages a manufacture of 33" x 6" size standard oil crusher and its parts.

III. Production Details and Process of Manufacture.

In order to keep project cost low, it is proposed to purchase cast iron castings from outside. These castings are machined at units workshop. It is proposed to purchase gears, worms, agitator, side shaft, etc., from outside.

IV. Inspection and Quality Control

The parts of the oil crushers should be manufactured from good quality material. To have interchangeability, the drawings should be prepared and specifications of raw materials should be laid down.

V. Land and Building

Coverd area 1500 sq. meters Rented Rs. 1500/ per month

VI. Machinery and Equipment

		Rs.
1. Heavy duty lathe 14'	1 No.	22,000.00
2. Heavy duty lathe 7'	1 No.	18,000.00
3. Lathe machine 8'	2 Nos.	30,000.00
4. Heavy duty lathe 8'	1 No.	20,000.00
5. Lathe machine 4'	1 No.	4,000.00
6. Shaping machine 24'	2 Nos.	14,000.00
7. Lathe machine 7'	1 No.	15,000.00
8. Heavy duty lathe 5'	1 No.	10,000.00

		Rs.
9. Electric grinder 8"	1 No.	1,000.00
10. Pillar drill 3 4"	1 No.	2,000.00
11. Pillar drill 1 1/2"	1 No.	5,000.00
12. Slotting machine 7 1/2"	1 No.	5,000.00
13. Welding machine	1 No.	2,000.00
14. Hacksaw machine	1 No.	2,000.00
15. Hand drill	1 No.	1,000.00
16. Flexible shaft grinder	1 No.	2,000.00
17. Tools, gauges, jigs & fixtures		5,000.00
18. Erection and installation charges		15,000.00
19. Office furniture and equipments		2,000.00
		1,75,000.00

VII. Raw Material Requirements (Per Month).

	Rs.
1. C.I. Castings, 10 tons, @2250 per ton.	22,500.00
2. MS plate 1/4" size, 750 KGs @ 2800/- per ton.	2,100.00
3. MS square bar 3"+3", 500 Kgs @ 2400/- per ton.	1,200.00
4. MS Round bar 2" dia. 500 KGs @ 2400/- per ton	1,200.00
5. MS Bar L. 1 1/2" dia. 350 Kgs @ 2400/- per ton	1,840.00
6. Bright bar 2" dia. 150 Kgs @ 2600/-per ton	390.00
7. Bearing of various sizes	5,000.00
8. Brass parts.	2,000.00
9. Spares such as gear chambers, catch bar, agitator, main shaft, side shaft, drawing shaft, etc.	12,500.00
10. Nuts and bolts, etc.	620.00
11. Miscellaneous paints, etc.	1,000.00
	49,350.00
Say	50,000.00

VIII. Staff and labour(PerMonth)			Rs.
1. Manager	1 No.		800.00
2. Skilled worker	3 Nos.		1,200.00
3. Semi-skilled worker	1 No.		300.00
4. Typist-cum-Clerk	1 No.		400.00
5. Peon	1 No.		200.00
6. Watchman	1 No.		200.00
7. Cost of labour benefit.			400.00
			<u>3,500.00</u>

IX. Other Expenses (Per Month)			Rs.
1. Rent			7,500.00
2. Electric and water			350.00
3. Oil and lubrication			100.00
4. Publicity expenses			150.00
5. Travelling expenses			200.00
6. Consumable tools.			100.00
7. Misc. expenses			100.00
			<u>8,500.00</u>

X. Working Capital (Per Month)			Rs.
1. Raw material.			50,000.00
2. Staff and labour			3,500.00
3. Other expenses			8,500.00
			<u>62,000.00</u>

XI. Total Capital Investment			Rs.
1. Machinery and Equip- ment			1,75,000.00
2 Working capital for 3 month			1,86,000.00
			<u>3,61,000.00</u>

XII. Cost of Production(Per Annum)			Rs.
1. Raw material			6,00,000.00
2. Salaries			42,000.00
3. Other expenses			1,02,000.00
4. Interest on capital @15%			54,150.00
5. Depreciation on machinery @10%			17,500.00
6. Sales expenses			5,000.00
			<u>8,20,650.00</u>

XIII. Total Sale Per Annum			Rs
1. By Sale of 25 standard crusher of 33'x 6" size @Rs. 31,000			7,75,000.00
2. By sale of spare parts of crushes eq- uivalent to 5 oil cru- shers			1,55,000.00
			<u>9,30,000.00</u>

XIV. Profitability per Annum		
Total sale—Cost of production =Profit.		
Rs. 9,30,000—Rs. 8,20,650	= Rs. 1,09,350.00	
	$1,09,350 \times 100$	
(a) percentage of profit on sale.	$\frac{9,30,000}{1,09,350} = 11.7\%$	
(b) percentage of profit over investment.	$\frac{1,09,350}{3,61,000} = 30\%$	

XV. Break Even Analysis		
$BEP = \frac{\text{Annual fixed cost} \times 100}{(\text{Fixed cost} + \text{profit})}$		
Fixed cost (Per Annum.)		
		Rs.
1. Rent		90,000.00
2. Interest		54,150.00
3. Depreciation on machi- nery and equipment		17,500.00
4. 40% of salaries		16,800.00
5. 40% of other expenses.		48,000.00
		<u>1,83,250.00</u>

$$BEP = \frac{1,83,250 \times 100}{(1,83,250 + 1,09,350)} = 62\%$$

XVI. Name and Addresses of Machinery suppliers

1. M/s. New/Bharat Engg. (Jamnager) Ltd. P. O. Box No. 131, Pandit Nehru Road, Jamnagar (Guj.)
2. M/s. Perfect Machine Tools Co., Bell Building, Sir PM Road, Bombay-1.
3. M/s. Batliboi & Co. (P) Ltd, P. Box. No. 190A V.B. Gandhi March, Nombay-400023.

(Reserved item Sl. Nos. 512, 513.)

I. Product and Its Uses

Paper pins are known to most of the people as it is used widely for pinning paper sheets in Office, schools etc. The paper pin is made of mild steel wire of 20-22 swg with a pointed end at one side. The pins are tinned so as to make them resistant to rusting.

II. Market Potential

The paper pins are used practically in every office, industrial and business establishments. These establishments are increasing every year, in number. The paper pins can be supplied to these establishments directly or through stationery items dealers. If supplied directly to these establishments by intensive sales efforts, there can be good demand, as the sale price to those establishments will be cheaper than the price at which they will purchase from dealers.

III. Production Target

It is proposed to manufacture one Ton of paper pins per month. There are different packings in the market like 100 pins strip, 25 gms. packet, 200 gms. & 400 gms. card board cartoons. For calculation purpose, it is proposed that the unit will produce monthly 3000 cartoons of 400 gms. gross weight. As the weight of the cartoon itself is about 55 to 60 gms. per cartoon. It is estimated the net weight of paper pins will be about 330 to 335 gms. in the cartoon.

IV. Production Details and Process of Manufacture

Hard drawn bright wire of suitable gauge is fed to automatic paper pin manufacturing machine where the paper pins are formed. Thereafter these paper pins are pickled and cleaned with water in a plastic containers to clean the surface. Then they are plated in the plating equipment using suitable tin salts. The plated paper pins are dried in the drier drum. As this is a small unit, it is presumed that the proprietor himself will supervise the unit and hence a supervisor is not provided separately.

V. Inspection and Quality Control

The pins shall have a well formed round head and sharp pointed. The pins shall be sufficiently strong and shall not bend in use. The pins shall be clean and bright. In this profile Nickel plating for pins is provided.

VI. Land & Buildings

	Rs.
Covered Area 75 sq. meters. (rented)	375·00

VII. Machinery Equipment

(1) Automatic paper pin machines 200 to 250 pieces/min.	4 Nos.	40,000·00
(2) Plating Barrel with 12 V. Dynamo set and other accessories including initial plating salts.	1 No.	12,500·00
(3) Drier Drum with motor.	1 No.	4,500·00
(4) D.E. Grinder 8" wheel size.	1 No.	1,000·00
(5) office furniture & equipment	—	1,000·00
(6) Installation and electrification	—	5,000·00
Total		64,000·00

VIII. Raw materials (Per Month)

H.B. Wire 21 to 23 Gauge	1 Ton.	4,000·00
--------------------------	--------	----------

IX. Staff & Labour (Per Month)

(1) Skilled worker	1 No.	400·00
(2) Unskilled worker	2 Nos.	400·00
(3) Welfare facilities for labour		200·00
Total		1000·00

X. Expenses (Per Month)

	Rs.
(1) Rent	375·00
(2) Electricity & Water	100·00
(3) Packing cost	1,000·00
(4) Sales expenses	300·00
(5) Stationery, postage and Misc. expenses	200·00
(6) Plating chemicals.	625·00
Total	2,600·00

XI. Working Capital (Per Month)

	Rs.
(1) Raw materials . . .	4,000·00
(2) Staff Labour . . .	1,000·00
(3) Other expenses . . .	2,600·00
Total	<u>7,600·00</u>

XII. Total Capital Investment

(1) Machinery & equipment	64,000·00
(2) Working capital for 3 months	22,800·00
	<u>86,800·00</u>

XIII. Manufacturing cost (Per Month)

	Rs.
(1) Raw Material	4,000·00
(2) Staff & Labour	1,000·00
(3) Other expenses	2,600·00
(4) Depreciation on machinery & equipment at 10%	540·00
(5) Investment on capital investment at 15%	1,085·00
Total	<u>9,225·00</u>
	<u>9,250·00</u>

XIV. Total Sales (Per Month)

By sale of 3000 card board cartoons of 400 gms. gross weight at Rs. 3·75 each	Rs. 11,250·00
---	------------------

XV. Total Profit (Per Month)

Profit=Total sales—Manufacturing cost.
=11250—9250
=Rs. 2,000/-

Annual profit =Monthly profit×12
=Rs. 2000×12
=Rs. 24,000·00

(a) Percentage of profit on sales :
=Profit per month

Sales per month
2000
=———×100
11250
=18%

(b) percentage of profit on Capital Investment :
=Annual profit

Capital investment
=24000
=———×100
86800
=27·6%

XVI. Break Even Analysis

Break Even point =Annual fixed cost

Annual fixed cost + Annual profit.

Fixed cost per month

	Rs.
(1) Rent	375·00
(2) 40% of staff & labour	400·00
(3) 40% of other charges excluding rent.	890·00
(4) Depreciation on machine & equipment	540·00
(5) Interest on capital investment.	1,085·00
Total	<u>3,290·00</u>
or Say	<u>3,300·00</u>

Annual fixed cost=3,300×12=39,600·00

Break even percentage.
=Annual fixed cost

Annual fixed cost—Annual profit—100
=39600
———×100
39600+24000
=39600
———×100
63600
=62%

XVII. Name and Address of suppliers of Machinery and equipment

- | | |
|--|--|
| (1) M/s. Burma Industrial Corporation, G.T. Road, Putlighat, AMRITSAR (Punjab.) | Supplies Paper Pin machine and drier drum. |
| (2) M/s. Momai Engineering Works, Industrial area, Plot No. 13, Patel Colony, JAMNAGAR-361001. | Supplies Paper Pin machine and drier drum. |
| (3) M s. S. Singh & Co. Gandhinagar, G.T. LUDHIANA. | } Plating equipment & Plating Salts. |
| (4) M/s. Ronak Industries Ltd. 11 A, Worli Seaface. BOMBAY-400018. | |

XVIII. Name and Addresses of suppliers of Raw Material

- (1) M/s. Mehta Manmal Chenmalji, & Co., 87-88, Kika Street, BOMBAY-400004.
- (2) M/s. Eastern Wire products. 223, Manicktolla Main Road, Calcutta-11.
- (3) M/s. Accurate Wire Industries, 2392, Hakim Bazar, Street, Delhi-6.
- (4) M/s. Andhra industrial Works, Industrial Estate, Cuddaph (A.P.)

(Reserved items Sl. No. 775).

I. Introduction

A. Paint brushes are generally of two types namely (a) Oval ferruled bound and (b) Round ferrule bound. Oval ferrule bound brushes are generally available in five sizes with denominations 10, 2|0, 3|0, 4|0 and 6|0, and round, ferrule bound brushes are of sizes, 1|0, 2|0, 3|0 & 4|0.

Oval ferrule bound types of brushes are meant for excellent painting jobs such as varnishing, superior finishing of paint work; round ferrule bound brushes is recommended for rough painting work like ground preparation and applying of undercoat, filling on surfaces of under painting etc. These types of brushes are widely used in industrial and household purposes. This scheme is drawn for the manufacture of Paint Brushes and Brushes made of natural bristles.

B. Market Potential: There is a good demand for paint brush especially from Railways, Structural Fabricators, interior decorates, building construction etc.

II. Production Target

2500 dozens of Paint brushes and brushes of natural bristles per month
Value Rs. 90,000/-

III. Production Detail and Process of Manufacture

Oval Ferrule bound brushes are made from soft/semi-stiff black bristles and brushes, round, ferrule bound are from Grey, semi-stiff bristles.

Handles: The wooden handles are made from reasonable straint grained and well seasoned wood of species of timber—AIM, BAN, HALDU, species.

Ferrule: Ferrule is made from PCRC M. S. Sheet of thickness 0.2 mm and nickel plated.

Plug: This is a wooden wedge used to impart greater flexibility to the brush.

Nails: For securing the ferrule to the handle from steel, nails of 1.40 mm dia and 12.5 mm long is used.

Cement: Vulcanised rubber based cement or any other pitch and synthetic resin is used for setting.

Bristle: Properly straightened bristles of natural colour.

The process of manufacture consists of the following operations:

1. Solid dressing up and bundle, straighten to fine point, dried & bundled according to size & length by weighing.
2. Filling on to metal ferrule.
3. Dipping from the other end into rubber vulcanising solution.
4. Drying in oven or air drying for setting upto 48 hrs.
5. Inserting wooden handles and nailing.
6. Polishing of the bristles and buffing for fine point.
7. Inspection.
8. Packing.

IV. Quality Standards Specification

The details/specifications for paint brushes have been laid down in the Indian Standards Specification No. IS-487-1976. This standard deals with scope, technology, material, manufacture, overall, dimensions, performance requirements, inspection and sampling etc.

IS: 384-1971; Brushes, Paint & Varnishes, Flat.

1103—1971—Brushes Artist & 1104—1963—Brushes lettering may be followed for product guidelines.

V. Land & Building (Rented)

Covered Area 250 sq metres Rs. 500 P.M.

VI. Machinery & Equipment

	Qty.	Rs.
7.Circular Saw 10" dia	one	4000
2. Disc sander 12" dia	one	2500
3. Multicut bobbing wood working lathe length of bed—3' & ht. of centre 4 1/2" dia	two	45000
4. Polishing & buffing m/c	two	9000

5. Elec. drying oven (air circulated) temp. up to 1500 c, Chamber size 3' x 3' with shelf	one	12000
6. Hand press No. 5	two	4000
7. Ferrule folding and crimping Toggle press 2 tons cap.	2Nos	12,000
8. Dipping tank hand tools, strictiser, weighing scale etc.		8,000
9. Installation charges		5000
10. Office equipment & furniture tables racks and hand-tools		6000
		1,07,500

VII. Raw materials / Consumable stores

1. Bristles 250 Kg. @Rs 200 Kg	50,000
2. Timber	1,500
3. PCRC sheets-22 to 24 swg.	1,500
4. Polish for wooden handles- rubber vulcanising solutions	2,000
5. Nails etc.	400
	55,400

VIII. Staff & Labour/month

A. Administrative & supervisory

	Nos.	Rs.
1. Manager-cum supervisor	1	750
2. Clerk-cum-typist	1	450
3. Storekeeper	one	400
4. Peon	one	200
5. Chowkidar	one	200
		2000

B. Technical & Other.

1. Machine operators	6	2400
2. Semi skilled operator	6	1800
3. Helper	4	800
		5000
Staff welfare @30%		2100
Total+A+B		9100

IX. Other expenses

1. Electricity & water	300
2. Consumable stores, grease, oil, cotton waste, nickel plating charges etc.	300
3. Packing materials including celophene papers rubber ring for wrapping brushes	1000

4. Advertisement	200
5. Postage stationery etc.	200
6. Transportation Charges	200
7. Taxes	100
8. Other expenses	500
9. Rent	2900

X. Working Capital/Month

1. Raw materials	55,400
2. Personnel	9,100
3. Other expenses	2,900
	67,400

XI. Capital Investment

1. Machinery & Equipment	1,07,500
2. Working capital for 3 months	2,02,200
	3,09,700

XII. Cost of Production/Month

1. Recurring expenses	67,400
2. Insurance	300
3. Depreciation @10%	890
4. Interest on total investment @15%	3,870
	72,460

XIII. Sales Proceeds

By sale of 2500 dozens of brushes of assorted sizes	90,000
---	--------

XIV. Profitability /month

$$\text{Profit} = \text{Sales} - \text{cost of production} = 90,000 - 72 = 460, 17,540$$

$$\text{Percentage of profit on sales} = \frac{17540 \times 100}{90,000} = 19.48\%$$

$$\text{Percentage of profit on return} = \frac{17540 \times 12 \times 100}{3,09,700} \text{ Say } 69\%$$

XV. Break Even point

Fixed Cost

Rent	500
Interest	3870
Insurance	300
Depreciation	890
40 % salaries	3640
40 % other expenses	1160
	10,360

$$\frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{profit}} = \frac{10,360 \times 100}{27,900} = 37.1 \%$$

XVI. List of Machinery suppliers

1. M/s Batliboi & Co.
P. B. 190-A, Forbes Street,
Fort Bombay-1
2. M/s International Machine Tools Corporation
75, Ganesh Avenue, Calcutta-13.

3. M/s Manek Lal & Sons,
163-164, Narayana Dhuru Street,
Fort, Bombay.

4. M/s Perfect Machine Tools Co. Pvt. Ltd.,
Bell Building, Sir P. M. Road,
Bombay-1

(Reserved items Sl. Nos. 796, 800)

I. Products and its uses

Panel pins and shoe tacks are wire products. Panel pins are actually small weir nails which are used for joining purposes like in manufacture photo-frames, wooden partition, wooden furniture, using wooden sheets or thin sections. Shoe tacks are used in the footwear industry for fixing the shoe soles to uppers. These are used by footwear manufacturers and repairers.

In this unit the manufacture of the above items have been combined to make the unit economically.

II. Market Potential

The main market for panel pins is wood furniture units. The shoe tacks are to be sold to footwear manufacturers and repairers. They can be sold either directly or through hardware merchant.

III. Production Targets

It is proposed to manufacture in this unit, 2.5 Tons of panel pins and 10.5 Tons of Shoe tacks per month. In order to make the unit economical, the manufacture of these two reserved items has been combined in one unit and a single profile has been prepared for both items.

IV. Production Details and Process of Manufacture

Hard drawn bright wire of 14G to 22G is fed to automatic panel pin making machine. In the panel pin making machine, the head is formed and the pointed end is made. The panel pins thus formed are polished in the polishing drum, in which leather pieces, was dust etc. are put.

The half hard or M.S. Wire of 15 to 16 Gauge is taken and fed to automatic Shoe tack making machine. The shoe tacks are formed in the machine. The Shoe tacks are then polished and made blue in colour by means of the annealing furnace.

V. Inspection and Quality Control

The panel pin heads shall be properly formed and concentric to the shank.

Both panel pins and shoe tacks should have proper sharp points.

VI. Land Building

Convered area 140 sq. meter rented	Rs.
	700.00

VII. Machinery and Equipment

(1) Panel pin making machine (Automatic) size length 6 mm to 25 mm wire gauge 22 to 18 G	1 No.	5,500.00
(2) Panel pin making machine (Automatic) size length 12 mm to 50 mm Gauge 20 to 14 G	1 No.	7,500.00
(3) Shoe tacks machine (Automatic) size t 25 mm wire gauge 15 16	1 No.	10,000.00
(4) Annealing furnace (coal fired) for blueing the shoe tacks cap. 125 Kg/hr.	1 No.	5,500.00
(5) Polishing drum	1 No.	2,500.00
(6) D. E. Grinder (Special) type 250 mm 10" size with four wheel mounting	1 No.	3,000.00
(7) Tools & workshop equipments		2,000.00
(8) Office furniture & equipments		5,000.00
(9) Installation and electrification		4,000.00
Total		45,000.00

VIII. Raw Materials (per Month)

(1) H. B. Wire 14 to 22 G 26 Ton	10,400.00
(2) M. S. Wire 15 16 G 11 tons	38,600.00
Total	49,000.00

IX. Staff & Labour (Per month)

(1) Foreman	1 No.	600.00
(2) Semiskilled worker	2 Nos.	500.00
(3) Unskilled workers	2 Nos.	400.00
(4) Watchman/Helper	1 No.	200.00
(5) Welfare Facilities for staff —		400.00
Total		<u>2,100.00</u>

X. Other Expenses (Per month)

	Rs.
(1) Rent	700.00
(2) Electricity & water	200.00
(3) Consumable tools, stores	300.00
(4) Oils, lubricants etc.	100.00
(5) Maintenance and Repair	200.00
(6) Freight & Cartage	250.00
(7) Packing cost	250.00
(8) Sales Expenses including travelling	300.00
(9) Stationery, Postage Misc.	300.00
Total	<u>2,600.00</u>

XI. Working Capital (Per month)

(1) Raw Materials	[49,000.00
(2) Staff & Labour	2,100.00
(3) Other expenses	2,600.00
Total	<u>53,700.00</u>

XII. Total Capital Investment

(1) Machinery & equipment	[45,000.00
(2) Working Capital for 3 months	1,61,100.00
Total	<u>2,06,100.00</u>
Say	<u>2,06,000.00</u>

XIII. Manufacturing Cost (Per month)

(1) Raw Materials	49,000.00
(2) Staff & labour	2,100.00
(3) Other expenses	2,600.00
(4) Dep. on machinery and equipment 10%	375.00
(5) Interest on capital investment at 15%	2,575.00
Total	<u>56,650.00</u>

XIV. TOTAL SALES (PER MONTH)

(1) By sale of 2.5 Tons of panel pins at Rs. 4500/- per ton	Rs. 11,250.00
(2) By sale of 10.5 Tons of shoe tacks at Rs. 4800/- per ton	50,400.00
Total	<u>61,650.00</u>

XV. Total Profit (Per Month)

Profit = Total sales — Manufacturing cost.
 = 61650 — 56650
 = Rs. 5000/-

Profit per annum = Profit per month $\times$ 12
 = Rs. 5000 $\times$ 12
 = Rs. 60,000/-

(a) Percentage of profit on Sales
 $\frac{\text{Profit per month}}{\text{Sales per month}} \times 100$

$\frac{5000}{61650} \times 100$
 = 8.13%

(b) Percentage of profit on investment
 $\frac{\text{Profit per annum}}{\text{Total investment}} \times 100$

$\frac{60000}{2,06,000} \times 100$
 = 29.54%

XVI. Break Even Analysis

Beak even point = $\frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}}$
Fixed cost per month

	Rs.
(1) Rent	700.00
(2) 40% of staff & labour	840.00
(3) 40% of other expenses including rent	760.00
(4) Depreciation on m/c. & Equipment	375.00
(5) Interest on capital investment	2,575.00
	<u>5,250.00</u>

Annual fixed cost =Fixed cost per month × 12
 =5250 × 12
 =Rs. 63000·00

Break even percentage :

$$\begin{aligned}
 &\frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100 \\
 &= \frac{63000}{63000 + 60000} \times 100 \\
 &= \frac{63000}{1,23,000} \times 100 \\
 &= 51.2\%
 \end{aligned}$$

XVII. Name and Addresses of suppliers of Machinery & Equipment

- | | |
|--|---|
| (1) M/s Burma Industrial Corporation G. T. Road putlights, AMRITSAR (Punjab) | } Supplies all machines including coal fired Annealing furnace & special, type Double ended grinder |
| (2) M/s Universal Screw Factory , Pvt. Ltd., Chheharta, AMRITSAR (Punjab) | |

DO.

- (3) M s International Machine Tools Corpn.
 5, Bank street,
 Behind State Bank of India,
 Fort,
 BOMBAY-400023.

XVIII. Names and Addresses of Suppliers of Raw Materials

- (1) M's Mehta Manmel Chenmalji & Co.,
 87,88,Kika Street,
 BOMBAY-400004.
- (2) M/s Eastern Wire Products,
 223,Manicktolla Main Road,
 CALCUTTA-11.
- (3) M's Accruate Wire Industries,
 2392 Hakim Bazar Street,
 DELHI-110006.
- (4) M/s Andhra Industrial Works,
 Industrial Estate,
 Cuddaph (A.P.)

(Reserved items 1. Nos. 458 and 384)

I. Product and Its Uses

Pencil sharpeners are used for sharpening the pencils. These are categorised as stationery items. These are manufactured from extruded aluminium material, aluminium castings and by moulding plastic materials.

Market Potential.

Due to rapid growth in education, there is good demand of pencil sharpeners from schools. The product is also used in offices.

II. Production Targets

It is proposed to manufacture 500 gross pencil sharpeners per month.

III. Production Details and Process of Manufacture

In this profile, it is proposed to purchase aluminium bar castings and brass screws from outside. Following operations are performed :—

Aluminium bars.	Steel strips.
1. Bar drawing.	1. Strip cutting.
2. Piece cutting.	2. Hole drilling.
3. Stamping.	3. Sharpening.
4. Main hole drilling.	4. Heat treatment.
5. Tapering.	5. Electroplating.
6. Slotting.	
7. Screw hole drilling.	
8. Tapping.	
9. Assembling.	

IV. Inspection and Quality Control

It is very important that the cutting edge of pencil sharpeners is properly ground and hardened. The life of sharpner will depend on the life of cutting edge. Similarly the size and design of hole should be suitable to sharpen the pencils of without breaking the lead. All dimensional checks should be carried out to produce a standard product.

V. Land and Building

	Rs.
Covered area 100 sq. metres.	Rented 500·00

VI. Machinery and Equipment

1. Bar drawing machine	1 No.	75,000·00
2. Circular saw metal cutting machine	2 Nos.	
3. Power press	1 No.	
4. Lathe (Small)	1 No.	
5. Taper drilling & end milling machine	1 No.	
6. Drill machine 1/2" cap.	2 Nos.	
7. Shearing machine	1 No.	
8. Blade grinding machine	1 No.	
9. Heat Treatment furnace	1 No.	
10. Tool and cutter grinder	1 No.	
11. Anodizing plant	1 No.	
12. Installation and erection charges		7,500·00
13. Office equipment furniture, etc.		2,500·00
Total		85,000·00

VII. Raw Material Requirements (Per Month)

1. Aluminium bar casting 1800 Kgs. @ Rs. 14/- per Kg.	25,200·00
2. Steel strip 115 Kgs. @Rs 24/- per Kg.	2,760·00
3. Brass screws 500 gross	580·00
4 Salt and chemical etc.	100·00
	28,640·00

VIII. Staff and labour (Per month)

1. Manager	1 Nos.	800·00
2. Skilled worker	8 Nos.	3,200·00
3. Semi-skilled worker	3 Nos.	900·00
4. Unskilled workers	2 Nos.	400·00
5. Cost of labour benefit		700·00
		6,000·00

IX. Other Expenses (Per Month)

	Rs.
1. Rent	500' 00
2. Electricity and water	400' 00
3. Consumable tools	200' 00
4. Oil and lubricants	100' 00
5. Publicity expenses	200' 00
6. Travelling expenses	200' 00
7. Packing expenses	3,000' 70
8. Miscellaneous	400' 00
	<u>5,000' 00</u>

X. Working Capital Required (Per Month)

1. Raw material	28,640' 00
2. Staff and labour	6,000' 00
3. Other expenses	5,000' 00
	<u>39,640' 00</u>

XI. Total Capital Investment

1. Machinery and equipments	85,000' 00
2. Working capital for 3 months	1,18,920' 00
	<u>2,03,920' 00</u>
SAY	<u>2,04,000' 00</u>

XII. Cost of Production (Per Annum)

1. Raw material	13,43,680' 00
2. Salaries	72,000' 00
3. Other expenses	60,000' 00
4. Interest on capital @15%	30,600' 00
5. Depreciation on machinery @10%	85,000' 00
6. Selling expenses	15,000' 00
	<u>5,29,780' 00</u>
SAY	<u>5,30,000' 00</u>

XIII. Total Sale (Per Annum)

(a) By sale of pencil sharpeners 6000 gross @Rs. 90/- per gross	5,40,000' 00
(b) By sale of aluminium scrap	50,000' 00
	<u>5,90,000' 00</u>

XIV. Profitability (Per Annum)

Total Sale—Cost of production Rs. 5,90,000—Rs. 5,30,000	=Profit Rs. 60,000' 00
(a) percentage of profit on 60,000 × 100 5,30,000	=11%
(b) Percentage of profit over investment 60,000 × 100 2,04,000	=29%

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed Cost} \times 100}{(\text{Fixed cost} + \text{Profit})}$$

Fixed cost of (per annum)

	Rs.
1. Rent	6,000' 00
2. Interest	30,600' 00
3. Depreciation on machinery & Equipments	8,500' 00
4. 40 % of salaries	28,800' 00
5. 40% of other expenses	21,600' 00
	<u>95,500' 00</u>

$$\text{B.E.P.} = \frac{95,500 \times 100}{(95,500 + 60,000)} = 61\%$$

XVI. Address of Machinery Suppliers

1. M/s. Panchasara Engineering Works,
A, 16/29, Shanker Tekri Udyognagar,
Jamnagar (Guj).
2. M/s. Keshavlal & Sons,
Old Post office, Jamnagar (Guj).
3. M/s. New Indian Engineering Works,
Bhaktinagar Station Road,
Rajkot-2 (Guj.)
4. M/s. Jolly Engineering Works, 60, Digvijay Plo
Jamnagar (Guj).

(Reserved item Sl. No. 779)

I. Introduction

A. Pen holders are commonly used for general writing purposes, fixing up on to a metal insert of the pen holder. This scheme deals with the manufacture of general type of pen holders made of wood, used in offices and educational institutions. There are two types of pen holders.

(1) Wooden handle, embedded metal and insert into metal ferule.

(2) Wooden handle with metal ferule (catcher).

They are generally of 150 or 170 mm long and diameters vary from 7 to 12 mm.

B. Market Potential

There is good demand for general type of pen holders widely used in Govt. offices, courts and educational institutions. The other factors influencing the demand is in the growth of Government offices and hospitals and health centres where usage of this type of pen-holders still exist.

II. Production Target

Pen Holders of 40,000 dozens per annum of Rs. 1,92,000/-

III. Production detail and process of manufacture

The pen holders consist of wooden handle, metal insert and metal ferule.

The wooden handle is one of continuous piece and round in cross section and symmetrically to tapered. The nib holding device is made of brass strip and would fit in all types of nibs. The holding device is generally embedded insert and the insertion of nib is reinforced with a ferule.

The body of the pen holder is made of wood and suitable timber such as babul, ebany, haldu may be used. They are turned from rounds and finished with a non-flaking and non-cracking lacquer colour.

The metal insert is made from 0.28 to 0.2 mm brass strip and nickel plated and pressed and formed to shape in a press.

The metallic ferule is also made from 0.2 to 0.28 mm of the brass strip and formed to shape in a press and is assembled to pen holder.

The pen holders are wrapped in tissue paper and packed in containers or boxes.

IV. Quality, Standards and Specifications

For product standards and specifications IS: 4118—1967 specifications for pen holders may be followed.

V. Land & Building (Rented)

Covered area—150 sq. meters 300.00 Rs.

VI. Machinery & Equipment

	Nos.	Rs.
1. Bench model high speed wood turning lathe (Atlas) or Sita 2 ft. bed length Ht. of Centre 4½"	4	28,000.00
2. Bench model high speed second operation lathe with centres for colour lacquering and horizontal drilling	4	16,000.00
3. Hand press No. 5	2	4,000.00
4. Hand toggle press no. 2 to 2 tonnes cap	2	6,000.00
5. Hand Shearing machine	1	2,000.00
6. Tool grinder double ended bench type 8" wheel dia	1	1,500.00
7. Vertical wood cutting Band saw wheel dia. 12" Rockwell or Similar		1,000.00
8. Work benches, office equipments etc.		4,000.00
9. Erection & Installation charges		8,000.00

73,500.00

VII. Raw Materials & Consumables/Month	Rs.
1. Brass strips 100 Kg. 0' 2 to 0' 28 mm thick	3,000' 00
2. Timber	500' 00
3. Lacquer colours, wood cutting tools Band Saw etc.	300' 00
	<u>3,800' 00</u>

VIII. Staff and Labour

A. Administrative & Supervisory	
	Rs.
1. Manager-cum Supervisory	600' 00
2. Ministerial staff 2 nos.	200' 00
3. Peon 1	200' 00
4. Chowkidar 1	200' 00
	<u>1,800' 00</u>
B. Technical & others	
1. Machine operators 7	2,100' 00
2. Helpers 2	400' 00
3. Packer	200' 00
Staff welfare @30%	1,350' 00
Total	<u>5,850' 00</u>

IX. Other Expenses

	Rs.
1. Power & water	150' 00
2. Maintenance & Repair	50' 00
3. Printing, Postage & Stationery	100' 00
4. Consumables (others)	50' 00
5. Packing expenses	200' 00
6. Transportation charges	200' 00
7. Taxes	100' 00
8. Rent	300' 00
	<u>1,150' 00</u>

X. Working Capital per month

1. Raw materials	3,800' 00
2. Personnel	5,850' 00
3. Other expenses	1,150' 00
	<u>10,800' 00</u>

XI. Capital Investment

1. Machinery & Equipment	73,500' 00
2. Working capitl for 3 months	32,400' 00
	<u>1,05,900' 00</u>

XII. Cost of production/per month	Rs.
1. Recurring expenses	10,800' 00
2. Insurance	100' 00
3. Depreciation of machinery & equipment @10% (say)	615' 00
4. Interest on capital investment @15% (say)	880' 00
	<u>12,395' 00</u>

XIII. Sales Proceeds :

By sale of 40,000 nos per nomth of value Rs.
16,000' 00

XIV. Profitability per month

Profit—sales —cost of production
16,00—12,395' 00
=3,605' 00

Percentage profit on sales $\frac{3,605 \times 100}{16,000' 00}$ 22' 53%

XV. Break even point

Fixed cost	Rs.
Rent	300' 00
Interest	880' 00
Insurance	100' 00
Depreciation	615' 00
40% salaries	2,340' 00
40% other expenses	460' 00
	<u>4,695' 00</u>

Fixed cost $\times 100$

Fixed cost + Profit

$\frac{4,695 \times 100}{8,300}$ 56' 6%

XVI. List of machinery suppliers

1. M/s; Maneklal & Sons,
115-116, Narayan Duru Street Fort, Bombay-1.
2. M/s. Perfect Machine Tools (P) Ltd.
Bell Buildings Sir P. M. Road Fort, Bombay-1
3. M/s. Atlas Works (P) Ltd.
119, Ripun Street Calcutta-16

XVII. Source of Raw Materials

- 1 M/s. Bombay Metal & alloys Mfg. Co.
Reary Road, Bombay.
2. M/s. Comani Metal Alloy, Bombay

(Reserved item Sl. No. 780)

I. Product and its uses

The demand for durable consumer goods increases as the living standard of the society goes up. The perumbulator is one of the such items. This is used to carry babies for short distances in the fresh air for giving them a changed airy atmosphere which is beneficial to their healthy growth. The demand for perumbulators (Prams) is increasing year after year.

II. Production Targets

It is proposed to manufacture 100 prams per month. The wheels of the prams are to be procured from outside market. Also the electroplating of parts will be got done from outside.

III. Production details and process of manufacture

The prams are made out of steel pipes, flats, rounds, rexine cloth, stuffing material and plywood. The pipes are bent on pipe bending machine. The steel flats are cut and bent to make the frame. The axle rods are made out of M. S. Round bars drawn to the size and drilled on drilling machine for securing the wheels. The rexine cloth along with stuffing materials is stitched on sewing machines. Finally the pram is fitted and covered with rexine cloth wherever required.

IV. Inspection and quality control

Pram is not a very precision item and therefore very rigid tests and inspections are not required. However, it should be seen that the wheels are properly fitted in the axles and their centre distances are maintained properly. Also the rigidity of the frame along with comfort for the child should be borne in mind. There are no ISI specifications for this item.

V. Land and Building

Covered area—200 sft.
metres (Rented) 1,000P.M.

VI. Machinery and equipments

1. Power Press—25 tons cap.
with 3 H. P. electric motor 1 No. 1,000
2. Pipe bending maching hand
operated 1 No. 1,000

3. Drilling machine 1 1/2" cap. motorised 1 H. P. motor 1 No.	2,000
4. Industrial sewing maching 1 No.	3,000
5. Hand tools and Fixtures .	2,000
6. Painting equipment . . . 1 Set	2,000
	20,000
Installation and electrification charges	2,000
Office furniture and equipment	2,000
Total	24,000

VII. Raw Material Requirements (per month)

	Rs.
1. Steel pipes 22 mm. dia. 1' 25 mm. thick—450 metres .	900
2. M. S. strip—20 mm. wide 2' 5 thick—500 Kg. .	1,500
3. M. S. Round 12 mm. dia. 150 Kgs.	450
4. Springs—400 Nos.	600
5. Wheels 400 Nos. @Rs. 4/- each	1,600
6. Cushioning material i. e. Foam Rexine cloth Plywood etc. @Rs. 60/- per pram	6,000
Total	10,050

VIII. Staff an labour (per month)

	Rs.
1. Manager 1	800
2. Foreman 1	600
3. Skilled workers 3	1,050
4. Semi skilled 4	1,000
5. Helpers 2	400
6. Clerk-cum-stores keeper 1	300
7. Peon-cum-chowkidar 1	200
Total	4,350

IX. Other expenses (per month)	Rs.
1. Electricity & water . . .	150
2. Consumable tools . . .	100
3. Oils and lubricants . . .	100
4. Postage and Stationery . .	100
5. Transportation & Cartage .	150
6. Parking Charges . . .	1,000
7. Rent . . .	1,000
8. Paints etc. . . .	500
9. Unforeseen expenses . . .	200
Total	3,300

X. Working Capital (for 3 months)	Rs.
1. Raw materials . . .	33,000
2. Salaries & wages . . .	13,050
3. Other expenses . . .	9,900
Total	55,950
Say	56,000

XI. Total capital Investment	Rs.
1. Total fixed Investment on machinery & equipment . . .	24,000
2. Working capital for 3 months . . .	56,000
Total	80,000

XII. Cost of production (per annum)	Rs.
1. Recurring expenses, i.e., 56,000 × 4 .	2,24,000
2. Interest on capital @ 15% per annum	12,000
3. Depreciation on machines @ 10% . . .	2,200
4. Sales expenses	5,000
Total	2,43,200

XIII. Sale proceeds (per annum)	Rs.
By Sale of 1200 perumbulators @ Rs. 225/- per piece	2,70,000

XIV. Profitability (per annum)
Profit = Sales minus cost of production
= 2,70,000 — 2,43,200
= 26,800

(i) Percentage of profit on sales 10.0 approx.

(ii) Percentage of return on investment — 33.5% approx.

XV. Break Even Analysis

B.E.P.	$\frac{\text{Annual Fixed cost} \times 100}{\text{Annual fixed cost plus profit}}$
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Fixed cost (per annum)

	Rs.
1. Rent	12,000
2. Interest on capital	12,000
3. Depreciation	22,000
4. 40% of salaries	20,880
5. 40% of other expenses	15,850
Total Rs. 62,850 say Rs. . . .	63,000

$$\text{B.E.P.} = \frac{63,000 \times 100}{63,000 \times 31,000} = 67\%$$

XVI. Names and address of suppliers of machinery and equipment

1. M/s. Perfect Machine Tools Co. (P) Ltd., Bell Building, Sir P. M. Road, Bombay-1.
2. M/s. Batliboi & Co. (P) Ltd., 190-A, Forbes Street, Bombay-1.
3. M/s. Burma Mechanical Works, Industrial Area 'A', Ludhiana.
4. M/s. Shubh Machinery Corpn., 15- Bank Street, Bombay-1.
5. M/s. Birdi Mechanical Works, G. T. Road, Near Manju Cinema, Ludhiana.

(Reserved item Sl. No. 726)

Introduction

The scheme envisages manufacture of Photo Enlargers, which are used in enlarging photos from smaller sizes to bigger sizes. These equipments are used by photo studios and other commercial art establishments. The equipment consist of all metal ventilated lamp house mounted on a solid moulded Aluminium Chasis. The movement of the lamp and its projection will be controlled by free Bellows movement with friction type rollers, which are mounted below the Aluminium Heat. This equipment can obtain 12" x 15" projection on base board from the negative of 2" x 3½". For bigger size enlargements lamp house can be tilted and the projection can be obtained on the wall side. At the bottom of the Bellows a 105 MM Congolens F 4.5 along with double mounted condensers are provided.

Basis and Presumption

he scheme is prepared on the assumption of the unit's production capacity of 25 Nos./month/shift. The market is assumed from the photo studios, artists, commercial photographers, cinema photographers and film studios. The equipment will be supplied with lens with masking board.

With the increase in the population and the temptation which has foreseen during these years to become a good artist or a commercial photographer, the demand for the photo enlargers has been increased considerably.

Technical Aspects

The photo enlargers consist of Aluminium Ventilated Lamp House mounted on an Aluminium Chasis. In manufacturing the same provision has given only to machine the Aluminium Head. Other parts such as Rubber Bellows, Condencers, Lens are to be bought out from outside. Provision for machining the base plate, to mount the equipment on a stand is also furnished. Aluminium castings will be bought out from outside sources.

Apart from manufacturing these items the unit can take up some other sub-contract works, in utilising the production equipments which are to be installed in the unit, or otherwise it will not be installed in the unit, or otherwise it will not be economical only to under take this type of product.

The unit will have to manufacture and sell atleast 18 Nos. of photo enlarger equipments for the breakeven point where there is no loss or profit.

Quality specifications

Manufactured according to customer standards and designs.

Production capacity/annum/shift.

300 Nos. in terms of quantity.

Value : Rs. 2.4 lakhs per annum.

Motive Power required: Approx. 25 HP.

Financial Aspects :

I. Fixed Capital :

Land and Building—Rented—Rs. 800/- per month
Covered area required—150 sq. metres.

Rs.

II. Machinery & Equipment :

(a) Centre lathe 6" Bed 9-1/2" CH with motor and necessary accessories similar to Kirloskar or PSG lathe	One	25,000.00
(b) Shearing machine Hand operated	One	1,500.00
(c) Sheet rolling machine Hand operated—Roller dia 6"	One	5,000.00
(d) Shaping machine D.M. Kapoor's or similar to Copper—24" stroke	One	18,000.00
(e) Heavy duty pillard rilling machine with motor and necessary accessories of 1" cap	One	5,000.00
(f) Double ended Bench Grinder	One	1,500.00
(g) Welding Transformer 250 Amps capacity—oil cooled	One	4,000.00
(h) Hand Press No. 6.	One	1,500.00
		61,500.00
(i) Testing & Measuring Equipment		2,000.00
(j) Electrification and installation charges @ 10% of cost of machines and equipments		6,000.00
Cost of Fixtures		500.00
Cost of Office Equipment		2,000.00
Pre-operative expenses		3,000.00
TOTAL CAPITAL		75,000.00

Working Capital/month :**(i) Personnel**

		Rs.
Designation (Administrative and Supervisory)		
1. Works Manager	One	600.00
2. Accountant	One	350.00
3. Store Keeper/Typist	One	350.00
		<u>1,300.00</u>

(ii) Technical/Skilled ? Unskilled : (per month)

1. Skilled Workers	3 Nos.	900.00
2. Helpers	2 Nos.	400.00
3. Watchman/Peon	2 Nos.	300.00
		<u>1,500.00</u>

TOTAL SALARIES—(i)+(ii) 2,800.00

Raw Materials including packing/month :

		Rs.
(a) M.S. Sheets, M.S. Rods of various sections, M.S. Tubes 3/4" to 1 1/2" dia. etc.	1 ton	4,000.00
(b) Aluminium Anodized Tubes from 1/2" dia to 2 1/2" dia. around 500 R. ft.		1,000.00

Bought out items :

(a) Rubber Bellows, electrical fittings, Aluminium cast domes, Lens, etc.		5,000.00
		<u>10,000.00</u>

Utility :

Power requirement—25 HP	300.00
Water	20.00
	<u>320.00</u>

Other contingent expenses (per month) :

Rent	800.00
Postage & Stationery	50.00
Consumable, Paints etc.	50.00
Sub-contract expenses such as Plating, Grinding, etc.	200.00
Advertisement	50.00
Insurance	50.00
	<u>1,200.00</u>

Total Recurring Expenses/month Rs. 3,100.00

Working Capital/3 months :

	Rs.
Raw Materials	10,000.00
Staff and Labour	2,800.00
Utilities	320.00
Other Contingent Expenses	1,200.00
	<u>14,320.00</u>

Total Recurring Expenditure per month 14,320.00

Working Capital for 3 months=Rs. 14,320 × 3 42,960.000

Total Capital Investment

(a) Fixed Capital	75,000.00
(b) Working Capital/3 Months	42,960.00
	<u>1,17,960.00</u>

Cost of Production/Month

1. Raw Materials	}	14,320.00
Staff & Labour		
Other expenses		
2. Depreciation on machinery @ 10% PA		1600.00
3. Interest on Capital @ 15% PA		1,500.00
		<u>16,420.00</u>

Turnover/year :

By Sale of 300 Nos. Photo Enlargers
@ Rs. 800.00/unit Rs. 2.4 lakhs/annum

Gross Profit (per year)

Production Turnover	2,40,000.00
Production Cost	1,97,040.00
PROFIT	<u>42,960.00</u>

Breakeven Point

In terms of quantity 246 Nos. per annum
In terms of Value Approx 82% Rs. 1,97,000.00

Any other information

The use of the Photo Enlarger is increasing day by day by the photographers, which is considered to be most economical for getting enlargement of photo copies from 30 mm Film. The consumption of photo film is saved from this which is considered to be costly. Since the number of photographers and Artists are developing their photographic art, and the demand for these items were also considerably increased day by day, the studios can be set up with this equipment by the Artists under the self employment scheme.

Machinery suppliers address:

1. M/s. Jayems Engineering Co.,
S. J. Park Road, Bangalore-2.
2. M/s. Hindustan Machine Crafts,
Unity Buildings, Bangalore-3.
3. M/s. Quality Machine Tools,
V. V. Puram, Bangalore-4.

Raw Material suppliers:

1. M/s. Hindustan Steel Ltd.,
Unity Buildings, Bangalore-2.
2. M/s. Annapurna Cooker Pvt. Ltd.,
Industrial Estate, Rajajinagar,
Bangalore-44.

(Reserved item Sl. No. 793).

I. Product and Its Uses

(a) Pilfer proof cap (p. p. cap) is a must for distilleries and many other products like oil, medicine, cold drinks etc. where these caps (with a seal arrangement) show that the product is in the original form and therefore build up the confidence of the buyer. There are several sizes in P.P. caps depending upon the size and shape of the container and particularly so the neck of the bottle. Generally 25mm size is used for medicines. This scheme confines to the manufacture of caps 25mm size. Since the operation involved in the manufacture are very simple the manufacture of this item can also be taken by disabled persons.

(b) Market Potential

Since there is a continuous increase in the industries manufacturing medicine, aerated water, hair oil, soft and hard drinks, the demand of this item is on an increase.

II. Production Target

It is proposed to manufacture 72,00,000 caps per annum.

III. Product Details and Process of Manufacture

First of all aluminium sheet which 24" broad and may be 120" long (1 Kg. 120"×24") is cut into as many sheets of size 17"×24" for the purpose of printing (name of the customer on the cap) by shearing machine. On this sheet of size 17"×24" the cap's developed section that is a coloured circle of 2" diameter (with allowance of 1/16") for 25mm size is printed. The printing arrangements are done from outside.

Thus total circles printed in a sheet of 17"×24" are $(24/2=12, 16/2=8) 12 \times 8=96-90$ (5% loss for corner printing etc.)

Now, in 1 kg.=7 sheet.

Therefore 1 Kg= $90 \times 7=630$ circles or caps.

Now strips of each row of circles are cut at the 1/32" gaps. This is done by shearing machine. So each strip will have a single row of 12 circles.

The strip is fed into power press where a compound die is used. Here every printed circle is blanked and then projected to the shape of a cup. This cup is blown off to a container by means of an air compressor fitted to the power press. In this way a speed of 60-70 strokes/minute to be obtained

depending upon the workers skill and machine. This means that 20,000 caps can be produced on one power press. The shape after this operation will be like this.

The cup is then put in a special machine for two operations to be done simultaneously, (a) Kourling at the top circumference, and (b) slotting at bottom, there is a circumference (for the purpose of seal). In this machine there is a rotating type die with kourling and slotting impressions.

The circular washers are fitted in the cap manually where required. These washers (cork) are available very easily.

VI. Missing**V. Land and Building**

Covered area 80sq. metres (rented) (Rs. 800 00)

VI. Machinery and Equipment s :

	Qty.	Indigenous/ imported	Approx. cost
1. Power press (geared) 10 Ton capacity fitted with automatic strip feeding attachment and compressor of 1 H.P. fitted on to the m/c (Special purpose machine)	1	Indigenous	15,000.00
2. Semi-automatic bead- ing m/c for knurling slitting operations etc.	1	"	12,800.00
3. Cap sealing machine for testing caps under production	1	"	4,000.00
4. Shearing machine (foot operated) size 1000 mm×20 SWG	1	"	3,500.00
5. Compound die for pun- ching drawing of cap 28 mm	2 sets		6,000.00
6. Beading machine, dies for knurling slotting etc. (cap size 28 mm)	2 sets		3,200.00
7. Office equipment (in- cluding office furni- ture, typewriter etc.)			10,000.00
8. Pre-operative expenses (project cost non-re- fundable deposits)			3,000.00
9. Installation charges@ 10% cost of machines excluding cost of dies, tools, etc.			3,500.00
Total			61,000.00

VII. RAW MATERIALS (for 24,000 caps per day/6,00,000 month)

Bought out components/Jobbing work

(i) 98.5 half hard 34 SWG (0.234 mm thick aluminium sheet required for production

of 24,000 caps per day (8 hrs shift) Approx.
1150 kg. @ 25.00 Rs. 28,750.00

(The most economical sheet of size is 850 x 575 mm which will produce about 452 caps

(ii) Printing of sheets (single colour) @ Rs. 800/- per thousand sheets of the size 850 x 575 mm which includes lacquer coating etc. 3,220.00

(iii) Wads of 28 mm size corks PVC coated @ Rs. 7/- per thousand 4,200.00

(iv) Packing cost (wooden or corrugated cartons) @ Rs. 10/- per thousand caps. 6,000.00

Say 42,170.00
42,200.00

VIII. STAFF & LABOUR (per month)

		Rs.
1. Manager (Sales, Purchase, Personnel)	One	600.00
2. Accounts Clerk/Cashier/Storekeeper	One	400.00
3. Peon	One	200.00
4. Chowkidars	Two	400.00
5. Supervisor	One	500.00
6. Machine Operator (for press machine)	One	300.00
7. Unskilled workers (for loading machine, shearing, packing etc.)	Four	800.00

Perquisites @ 15% 3,500.00
525.00

Say 4,025.00
4,000.00

IX. OTHER EXPENSES (per month)

	Rs.
1. Rent (8 metres x 10 metres) @ Rs. 10/- per sq. metre	800.00
2. Power -10 KWH units @ 0.35 per unit	625.00
3. Water etc.	75.00
4. Postage and stationery	200.00
5. Consumable stores	300.00
6. Repairs and maintenance	200.00
7. Transport charges	500.00
8. Insurance, taxes etc.	100.00
9. Sales expenses	1,000.00
10. Miscellaneous expenditure	500.00

4,300.00

X. WORKING CAPITAL (per month)

1. Raw materials	42,200.00
2. Staff & labour	4,000.00
3. Other expenses	4,300.00

50,500.00

Working Capital for 23 months 1,51,000.00

XI. TOTAL CAPITAL INVESTMENT :

	Rs.
1. Fixed Capital	61,000.00
2. Working Capital	1,51,500.00
	2,12,500.00

XII. COST OF PRODUCTION (per annum)

1. Raw materials	5,06,400.00
2. Salaries	48,000.00
3. Other expenditure	51,600.00
4. Depreciation on machinery @ 10%	3,500.00
5. Depreciation of dies & tools @ 25%	2,500.00
6. Depreciation on office equipment @ 20%	2,000.00
7. Interest on total investment @ 15%	31,875.00
Total cost of production	645,875.00
Say	6,46,000.00

XIII. TOTAL SALES (per Annum)

	Rs.
1. P. P. Caps of 28 mm size 72,00,000 Nos. @ Rs. 100/- per 1000 pcs.	7,20,000.00
2. By sale of aluminium scrap (33% of material) @ Rs. 13/- per kg.	65,000.00
Total	7,85,000.00

XIV. PROFITABILITY (per annum).

Total Sales - Cost of Production =	Profit
7,85,000.00 - 6,46,000.00 =	1,39,000.00
(a) Percentage Profit on sales =	$\frac{1,39,000 \times 100}{7,85,000}$
(b) Percentage of return =	$\frac{1,39,000 \times 100}{2,12,000} = 65\%$

XV. BREAK EVEN ANALYSIS

$$BEP = \frac{\text{Annual fixed costs} \times 100}{(\text{Fixed Cost} + \text{Profit})}$$

Fixed Cost (per annum)

1. Rent	9,600.00
2. Interest	31,875.00
3. Depreciation on Machinery & Equipment	8,000.00
4. 40% of salaries	19,200.00
5. 40% of other expenses	20,640.00
	Rs. 89,315.00
Say Rs.	90,000.00

$$BEP = \frac{90,000 \times 100}{90,000 + 1,39,000} = 39\%$$

ADDRESSES OF SUPPLIERS

For Raw Materials

1. Bharat Aluminium Company Ltd.
F-41, N.D.S.E. Part I,
New Delhi-11004.

2. Hindustan Aluminium Corpn. Ltd.,
11, Tolstoy Marg,
New Delhi-110001.

3. Indian Aluminium Company Ltd.
United Commercial Bank Bldg.
New Delhi-110001.

For Machinery/Plant, Dies, Tools & Equipment

1. Jaycee Seals Pvt. Ltd.
524, Nirankari Colony,
Delhi-110009.

2. Mono-Pack Pvt. Ltd.
10/65 Industrial area Kirtinagar,
New Delhi-110015.

Reserved item Sl. No. 391

I. Product and its uses

This item is the primary tillage implement used for mechanical manipulation of soil and is drawn by animals. In rural areas, peasants and farmers are very much dependent on this implement. In traditional methods of manufacture, local artisans would cater to their demand. Now a days situation is changed and it is necessary to adopt intermediate improvement in the method of manufacture and marketing. Utilisation of local talent is also possible if an unit is set up in a rural area.

II. Market Potential

Regional marketing of the item is the most suitable of marketing methods for the small scale manufacturers of rural or semi-urban areas. There is enough marketing scope for units producing this item capably according to some defined quality. If an unit is set up in small sector in rural area, there may be sufficient other type of general jobs.

III. Production Targets

In this scheme, calculations are based on production of 500 nos. of Ploughs and 500 nos. of shares per month.

IV. Production Details and Process of Manufacture

The shares are replaceable items when worn out and is made of chilled grey iron or hardened steel. Other components may be made of cast iron grade 20 or M.S. The beam and handle are made of seasoned hard wood. These components are assembled by bolts and nuts.

In view of limited quantity of output for individual units or rural industry the scheme has been worked out for hardened steel shares.

V. Quality control and standards

For the guidance in manufacture the following I.S.I. specifications will be helpful.

IS : 2191—1976 (Ploughs)

IS : 6459—1972 (Shares)

IS : 6327—1971 (Shares)

The inspection should be carried out according to the I.S.I. specification. Special care should be taken to obtain proper quality of the carbon steel which is the main foundation of the quality of the product.

VI. Land and building

Covered area of 200-Square metre should be rented @ Rs. 5/- per metre per month Rs. 1000 per m.

VII. MACHINERY AND EQUIPMENT

	Rs.
1. Spring Hammer 100 KG Ram weight complete with motor and accessories	25,000.00
2. Hearth with blower	2,000.00
3. Heat Treatment Furnace—10000C complete with accessories	12,000.00
4. Tempering Furnace with accessories	6,000.00
5. Quenching Tanker—2 Nos.	1,000.00
6. Hardness Tester (Rockwell) with accessories	7,000.00
7. Bench Drilling machine $\frac{1}{2}$ " capacity	2,000.00
8. Work Bench with vices	1,000.00
9. Hand Tools & Measuring Instruments	4,000.00
10. Erection, electrification etc.	6,000.00
11. Office furniture and equipments	4,000.00
	70,000.00

VIII. RAW MATERIALS (per month)

1. Castings @ Rs. 3/- average per Kg. 2 tonnes	6,000.00
2. Carbon tool steel C 75-55 M.T. @ Rs. 6/- per Kg.	21,000.00
3. M.S. rods, angles etc.—2 M.T. @ Rs. 2.50 per Kg.	5,000.00
4. Seasoned wood—11 mpsum	10,000.00
	42,000.00

IX. SALARIES & WAGES (Monthly)

1. Manager-cum-Engineer	1,000.00
2. Clerk-cum-Accountant	500.00
3. Foreman	600.00
4. Heat Treater	500.00
5. Semi Skilled workers (2 Nos.)	500.00
6. Unskilled workers (4 Nos.)	800.00
7. Peon-cum-watchman (2 Nos.)	400.00
	4,300.00

X. OTHER EXPENSES (Monthly)

1. Rent	1,000.00
2. Power & Electricity	250.00
3. Transport and conveyance	250.00
4. Maintenance and replacement of small tools	250.00
5. Labour amenities	600.00
6. Consumable stores	200.00
7. Contingencies	150.00
	2,700.00

XI. WORKING CAPITAL

(3 Months recurring expenses)

	Rs.
1. Raw Material	1,26,000·00
2. Salaries and Wages	12,900·00
3. Other expenses	8,100·00
	<u>1,47,000·00</u>

XII. TOTAL CAPITAL INVESTMENT

1. Fixed Capital	70,000·00
2. Working Capital	1,47,000·00
	<u>2,17,000·00</u>

XIII. COST OF PRODUCTION (Annual)

1. Manufacturing expenses	5,88,000·00
2. Depreciation of machinery & equipment @ 10% per annum	70,00·00
3. Interest on capital investment @ 15% per annum	32,500·00
	<u>6,27,550·00</u>

XIV. SALES PROCEEDS (Annual)

1. By sales of 6000 Ploughs @ Rs. 80/- each	4,80,000·00
2. By sales of 6000 Shares @ Rs. 35/- each	2,10,000·00
	<u>6,90,000·00</u>

XV. PROFITABILITY (Before Taxes)

Profit=Rs. 6,90,000—Rs. 6,27,550=Rs. 62,450·00
The profit is 9% of sales and 28.7% of
Capital Investment.

XVI. BREAKEVEN ANALYSIS

Fixed Cost :

	Rs.
1. Depreciation of machinery	7,000·00
2. Interest on Capital Investment	32,550·00
3. Rent	12,000·00
4. 40% of salaries & wages	20,640·00
5. 40% of other expenses	8,160·00
	<u>80,350 00</u>

$$\text{Breakeven point} = \frac{\text{Fixed Cost} \times 100}{\text{Fixed cost} + \text{Profit}}$$

$$\begin{aligned} & \frac{80350 \times 100}{80350 + 62450} \\ & = 456\% \end{aligned}$$

XVII. SUPPLIERS OF MACHINERY

1. Batliboi & Co.,
98A, Armenian Street,
MADRAS-600001
2. Perfect Machine Tools Ltd.,
Bell Building, Sir P.M. Road
Bombay.
3. Indian Furnace Co.,
12A, Dr. Annie Besant Road,
Bombay-400012.
4. Power Tools & Appliances Co.,
2A, B.B.D. Bagh East,
Calcutta-700001.

(Reserved item Sl. No. 439)

POSTAL WEIGHING MACHINE

I. Product and its uses

Postal weighing machines are a type of beam scales most commonly used for weighing small postal items like covers and small packets weighing not more than 1 Kg. This type of postal weighing machine can be grouped in Class 'B' Scale which is used for weighing drugs, chemicals and perfumery etc. This machine can be seen in all Govt. and private offices in their despatch section. This machine with equal arms has three knife edges, three bearings, an indicator (pointer) in the centre and pans suspended from the end knife edges.

II. Market Potential

These scales are to be sold to mostly P & T Department. However big offices in private and Govt. sector use these weighing machines to weigh the letters to know the postal stamps to be affixed to them while despatching the letters.

III. Production Targets

It is proposed that the unit will manufacture 100 Nos. of weighing machines per month.

IV. Production details and process of manufacture

The required brass sheet in different gauge thicknesses are purchased from the market. These sheets are cut into required shapes and sizes with the help of Shearing machine. The brass wires are bent according to the shapes of pans in bending jigs. These pans are then drilled diametrically in the required places for the sake of rivetting with the pan plates. The brackets bearing are cast with the help of dies when the metal is in the molten state and are finished. The knife edges are fixed. The main pillar is fixed with the base wooden plate with the wood screws and the complete balance is assembled with arms pans, indicators etc.

V. Inspection and Quality Control

The weighing machines manufactured are to be tested for the sensitiveness at no-load and full-load.

After due inspection and testing these machines are to be stamped and sealed by the verifying authority.

VI. Land and Building

Building 120 sq. mts. covered area and 80 sq. mts. uncovered area (rented) .	Rs. 600.00
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VII. Machinery and Equipment

1. Hand lever shearing machine (combination cutting m/c. or universal shear) Cap. 5 mm sheet, cutting	1 No.	1,500.00
2. Collet lathe 24" length of bed. Collet cap 5/8"	1 No.	3,400.00
3. Drilling machine 1/2" cap	1 No.	1,500.00
4. Gas welding equipment	1 No.	2,500.00
5. Double ended grinder 8"	1 No.	1,500.00
6. Crucible furnace with air blowers motor	1 No.	5,000.00
7. Tools, dies, jigs etc.		5,100.00
8. Office furniture & equipment		2,100.00
9. Installation & electrification		2,400.00
		25,000.00

VIII. Raw Material Requirement

(Per month) :

1. Bronze ingots	11 Kg.	330.00
2. Brass Sheets	60 Kg.	2,400.00
3. Brass rods & wires	30 Kg.	1,020.00
4. Purchase parts like wooden base screws, knife edges, pins etc.		750.00
		4,500.00

IX. Staff & Labour (Per month)

1. Supervisor/Foreman	1 No.	500.00
2. Skilled workers	4 Nos.	1,200.00
3. Skilled worker Fitter	1 No.	300.00
4. Unskilled workers.	3 Nos.	600.00
5. Cost of labour benefits		200.00
		2,800.00

X. Other Expenses (Per month)

1. Rent	600.00
2. Electricity & Water	80.00
3. Oil & lubricants including furnace oil	200.00
4. Consumable tools	100.00
5. Maintenance	100.00
6. Cartage & freight	50.00
7. Packing cost	200.00
8. Publicity and sales expenses	100.00
9. Stationery, postage expenses	200.00
	1,630.00

Say Rs. 1,600.00

Working Capital Requirement

(Per month) :	R s.
1. Raw material	4,500·00
2. Staff & Labour	2,800·00
3. Other expenses	1,600·00
	<u>8,900·00</u>

II. Total Capital Investment

1. Machinery & equipment	25,000·00
2. Working capital for 3 months	26,700·00
	<u>51,700·00</u>
Say Rs.	52,000·00

XIII. Cost of Production (Per month)

1. Raw Material	4,500·00
2. Staff & labour	2,800·00
3. Other expenses	1,600·00
4. Depreciation on m/c & equipment	210·00
5. Interest on capital investment @15% per annum	650·00
	<u>9,760·00</u>
Say Rs.	9,800·00

XIV. Total Sales (Per month) Rs.

By way of selling 100 postal weighing machines at Rs. 110/- per piece 11,000·00

XV. Profitability (Per month)

Total sales—Cost of production	= Profit
Rs. 11000—Rs. 9,800·00	= Rs. 1200·00
(a) Percentage of profit on sales	$\frac{1200 \times 100}{11500} = 10·43\%$
(b) Percentage of profit on investment	$\frac{1200 \times 12 \times 100}{52000} = 28·56\%$

XVI. Break even Analysis

$$\text{B. E. P.} = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual fixed cost} + \text{Profit}}$$

Fixed cost per month

(1) Rent	600·00
(2) Interest	650·00
(3) Depreciation	210·00
(4) 40% of staff & labour	720·00
(5) 40% of other expenses excluding rent	400·00
	<u>2,580·00</u>

Fixed cost per annum = $2580 \times 12 = \text{Rs. } 33,960$.

$$\text{B. E. P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{profit}}$$

$$= \frac{33960 \times 100}{33960 + 14400} = 70\%$$

XVII. Names and Addresses of Machinery Suppliers

1. M/s. Batliboi & Co. (P) Ltd.
190/A, Forbes Street,
Fort, Bombay-400001.
2. M/s. Pioneer Equipment Co. (P.) Ltd.
Padra Road,
Baroda (Gujarat) Furnace
3. M/s. International Machine Tools Corporation.
5, Bank Street Behind State Bank,
Fort, Bombay-400023.

XVIII. Names & Addresses of raw Material Suppliers

1. M/s. Indian Metal industries,
155-157, Nagdevi Street,
Bombay-400003.
2. M/s. Mehta Manzal Chenmalji & Co.
87-89, Kika Street,
Bombay-400004.
3. M/s. Baijnath Engineering Works,
No. 2 2nd Floor,
Adiyara Industrial Estate,
Sun Mill Road,
Lower Parel,
Bombay-400013.

(Reserved item Sl. No. 988)

I. Product and its Uses

Poultry as an industry is developing fast. A vast country with huge population, India requires a huge quantity of eggs. India also has a large vegetarian population. But many of them have started taking eggs from poultries now-a-days. So, there is a tremendous scope of developing poultries trading with only eggs in small towns and semiurban areas. All such poultries, with low investments, will at least require Containers for water and feeders. These are basically sheet metal fabricated articles and do not have any complication in manufacturing techniques. So, these items can be manufactured by rural small scale units with low capital investment. The feeders may be of two types:

- (1) Straight line feeders where chickens can get the feed standing on both sides of channel type feeders.
- (2) Circular feeders, where chickens are required to stand around the feeder which has a round container and the feed stock get filled up from top and come down on gravitational effect.

II. Market Potential

Most of the poultries obtain them from fabricators on job order basis as there is no organised manufacturers in this country in this line. If production is carried out in lots, in a planned way cost of production will go up as many poultries keep these equipment in their sheds to the barest minimum due to paucity of fund. Apart from this non-availability of ready equipment also sometime force poultry owners to fabricate their own requirements. Specially as demand of eggs are increasing day by day, there is ample scope for equipment manufacturers in this field.

III. Production Target

The estimates have been made on the basis of 300 nos. Circular Drinking facilities and 150 nos. of Circular Feeder and 150 nos. of Longitudinal feeders per month. Even then there will be some scope of fabricating some additional sheet metal jobs.

IV. Production Details and Process of Manufacture

For Fabrication of Feeders and Drinking Containers, G. I. Sheets, M. S. Wires and rods are mainly needed. These items are cut to size by hand shearing or treadle guillotine shearing machines. Then beading operations and folding operations may be performed in folding and hand press brakes. Then the cut pieces are assembled with suitable fixing arrangements.

V. Quality Control and Standard

There is one I. S. I. Specifications on these items No. IS: 5255—1969 for Portable Poultry Feeders. Quality of the products will be dependent on the surface finish of sheets which will be purchased from dealers. The galvanised iron sheet should be properly checked before purchase to ensure that these are properly galvanised. Leakage of water should be thoroughly checked before despatch.

VI. Land and Building

Rs.

50 square metres of covered area to be rented @Rs. 5/- per square metre per month 250.00

VII. Machinery and Equipment

Rs.

1. Treadle Guillotine Shearing Machine 36" capacity	4,000.00
2. Geared type Hand Shearing Machine cap. upto 6 mm	500.00
3. Toggle action hand operated multi-purpose Bender, Capacity 1 1/2" x 16SWG	1,000.00
4. Roll type edge Folding Machine Capacity 32 inches	1,000.00
5. Hand operated Press Break Capacity 36"	4,000.00
6. Hand Tools measuring instruments etc.	500.00
7. Work bench vise dies etc.	2,000.00
8. Towards erection, electrification etc.	1,000.00
9. Furnitures and office equipments	2,000.00
	16,000.00

VIII. Salaries and Wages (Monthly)

Rs.

1. Manager-cum-Engineer	800.00
2. Clerk-cum-Storekeeper	500.00
3. Skilled worker @Rs. 400 per month	400.00
4. Semi skilled workers @250 per month	500.00
5. Apprentices @Rs. 100 per month	400.00
6. Watchmen=cum=Peon @Rs. 200 per month	400.00
7. Labour amenities	500.00
	3,500.00

IX. Raw Materials per Month)

	Rs.
1. G. I. Sheets of various gauges 1 M. T. @ Rs. 4000 per M. T.	4,000·00
2. M. S. Wires of various gauges I Quintal @ Rs. 330 per Quintal	330·00
3. M. S. Rods of various dies 3 mm to 6 mm @ Rs. 260 per Quintal	260·00
4. Ghamellas For Water Containers 300 Nos. Rs. 20/-each	6,000·00
5. Fasteners and other sundries	200·00
	<u>10,790·00</u>
Say Rs.	<u>10,800·00</u>

X. Other Expenses (per month)

	Rs.
1. Rent	250·00
2. Electric bills	50·00
3. Maintenance and replacement of small tools	100·00
4. Transport and conveyance	200·00
5. Contingencies	200·00
	<u>800·00</u>

XI. Working Capital (3 Months recurring expenses)

	Rs.
1. Salaries and Wages	10,500·00
2. Raw Materials	32,400·00
3. Other expenses	2,400·00
	<u>45,300·00</u>

XII. Capital Investment

	Rs.
A. Fixed	16,000·00
B. Working	45,300·00
	<u>61,300·00</u>

XIII. Cost of Production (Annual

	Rs.
1. Manufacturing Cost	1,81,200·00
2. Depreciation of m/c @ 10 per annum	1,600·00
3. Interest on Capital @ 15% per annum	9195·00
4. Marketing expenses @ 10% of sales	26,100·00
	<u>1,18,095·00</u>
Say Rs.	<u>2,18,100·00</u>

XIV. Sales Proceeds (Annual)

By sales of :	Rs.
(1) 1800 Nos. Circular Feeders @ Rs. 35/- each	63,000·00
(2) 1800 Nos. Charrel type Feeders @ Rs. 30/-each	54,000·00
(3) 3600 Nos. Circular Drinking Facilities @ Rs. 40/- each	1,44,000·00
	<u>2,61,000·00</u>

XV. Profitability (before charging taxes)

Profit (XIV—XIII) is Rs. (261000—218100) = 42,900·00
 The profit is 16.5% of sales and 70% of Capital Investment

XVI. Break Even Analysis :**A. Fixed Cost**

	Rs.
1. Depreciation of M/c	1,600·00
2. Interest on Capital investment	9,195·00
3. Rent	3,000·00
4. 40% of Salaries & Wages	16,800·00
5. 40% of other expenses	2,640·00
	<u>33,235·00</u>

Say Rs.

33,250·00

B. Net fixed Cost]

$$\text{Break even point} = \frac{\text{Net Fixed Cost} \times 100}{\text{Net Fixed Cost} + \text{Profit}}$$

$$= \frac{33250 \times 100}{33250 + 42900} = 40.7\%$$

XVII. Source of Machines

- (1) International Machine Tools Corporation, P. B. No. 799, Fort, Bombay-23.
- (2) Ashok Metal Industries, Tagore Road, Bhaktinagar, Rajkot-360 002.
- (3) Atlas Works 119, Ripon Street, Calcutta-16.
- (4) Ashok Manufacturing Co. (P) Ltd., 37, Panchkuin Road, F. B. No. 305, New Delhi-110 001.

(Reserved item Sl. No. 548)

I. Product and its uses

Mostly the pressure die castings are used in automobiles, electrical equipments etc. With the increasing number of these required with the general growth, there exists a potential for pressure die castings.

II. Production Target

80 Tons of Pressure Castings Value Rs.
17,60,000.00 per annum.

III. Production details and process of manufacture

Pressure die castings are the castings made on pressure die casting machine in which the metal usually non-ferrous alloys are injected into the cavity under pressure. These castings have superior finish and do not require subsequent machining. The quality of casting obtained by this method are much superior to those got by gravity castings.

IV. Quality Standards

Generally the quality of the castings are required to meet the customers' specifications. The specifications could be achieved by having dies fabricated accurately through an established tool room.

V. Land and Buildings

	Rs.
Total area 450 sq metres	9,000.00
Covered area 300 sq. metres	15,000.00
	<u>24,000.00</u>

VI. Machinery and Equipments

1. Pressure die casting M/c Cap. upto 2 kg. in Aluminium and 4 Kg. in zinc complete with 10 HP motor Electrical etc.	1,75,000.00
2. Melting Furnace (oil fired) with blower 3, HP Motor	25,000.00
3. Centre Lathe 3" Heavy Duty with all accessories 3 H.P.	20,000.00
4. Shaping Machine 24" storkes, 3 H.P. Motor electricals	15,000.00
5. Pillar drilling machine complete with motor 1 H.P.	3,000.00
6. Double ended grinder pedestal types 2 HP Motor	3,500.00
7. Bench Grinder double ended 1/2 HP Motor	1,500.00
8. Flexible shaft grinder 2 HP Motor	2,000.00
9. Other measuring tools, hand tools, die sets etc., with one metallurgical Lab.	70,000.00
	<u>3,15,000.00</u>

	Rs.
Expenses towards Electrification and installation etc., @10% of the cost of machinery	31,500.00
Furniture and office equipments	5,000.00
	<u>3,51,500.00</u>

VII. Raw Material (Per Month)

	Rs.
1. Aluminium Alloy Ingots 7 tons @ Rs. 16000 per M. T.	1,12,200.00
2. Oils and other consumables	3,500.00
	<u>1,15,500.00</u>

VIII. Staff and Labour (Per Month)

		Rs.
1. Supervisor/Manager	1 No.	800.00
2. Skilled Workers	3 Nos.	1,200.00
3. Semi skilled workers	2 Nos.	400.00
4. Other Chemist Lab. Asstt.	1 No.	500.00
5. Clerk	1 No.	300.00
6. Typist	3 No.	300.00
		<u>3,500.00</u>

IX. Other Expense (per month) (On single shift Basis)

	Rs.
1. Power & Water Charges	500.00
2. Advertisement & Travelling	1,000.00
3. Transport	500.00
4. Maintenance, repair & renewal of machinery	500.00
5. Consumable stores	300.00
6. Other contingencies	500.00
	<u>3,300.00</u>

X. Working Capital (per month)

	Rs.
(A) 1. Raw Material	1,15,000.00
2. Staff & labour	3,500.00
3. Other expenses	3,300.00
	<u>1,21,800.00</u>
(B) Working Capital For 3 months	
3 × Working capital per month	= 1,21,800 × 3
	= <u>3,65,400.00</u>

XI. TOTAL CAPITAL INVESTMENT

1. Fixed Capital	3,75,500.00
2. Working capital for 3 months	3,65,400.00
	<u>7,40,900.00</u>

XII. Total cost of production (per annum)

	Rs.
1. Working capital	14,61,600.00
2. Depreciation on machinery & equipment @ 10%	31,500.00
3. Depreciation on building @ 5%	750.00
4. Depreciation on Furniture and office equipments @ 15%	750.00
5. Interest on total investment prevailing rates @ 15%	1,11,000.00
	<u>16,05,600.00</u>

XIII. Sales proceeds (per annum)

By sales of 80 tonnes Castings @ 22000/- per tonnes	17,60,000.00
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XIV. Profitability

Return by sales	17,60,000.00
Cost of production	(—) 16,05,600.00
	<u>1,54,400.00</u>

$$\text{Percentage of profit over sales} = \frac{1,54,500 \times 100}{17,60,000} = 8.7\%$$

$$\text{Percentage of profit Over return (investment)} = \frac{1,54,400 \times 100}{740,900} = 20.83\%$$

XV. Break even point**Fixed Cost**

	Rs.
1. Interest	1,11,000.00
2. Depreciation	33,000.00
3. 40% of wages	16,000.00
4. 40% of expenses	16,800.00
	<u>1,76,800.00</u>

$$\text{B.E.P.} = \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} = \frac{1,76,800 + 100}{1,76,800 + 154,400} = 53.38\%$$

XVI. Names and Address of machinery and equipment supplies

1. M/s. Pioneer Equipmnet Co. Ltd.
139, Meadows street
Bombay
Pressure die casting M/C
 2. M/s Hindustan Furnaces
Viyyur
Prichur (Kerala)
Furance
 3. M/s Leading Engg. Works
31, Rohtak Road
New Delhi
Lathe
 4. M/s India Machine Ltd.
29, Strand Road,
Calcutta.
Shaping
 5. M/s Andhra Machine Tools (Regd)
Door No. 9-61-9
Rajendra Prasad Road
Vijayawada-1 Andhra Pradesh
Drilling
 6. M/s Diamond Engg. Co.
B-2/52 Veer Desai Road
Andheri West
Bombay
Grinder
- (Reserved item Sl. No 354)

I. Product and its uses :

Pressure Gauges is a device to indicate pressure of a liquid, air or gas or steam contained in a container, so as to prevent any damage to the equipment where it is mounted. The pressure gauge is based on bourdon-tube principle. They are calliberated gauges with reference to a master gauge and regularly checked for accuracy. These are used in air compressors, chemical plants, processing plants, boilers, gas-cylinder and similar other applications.

II. Market Potential

Pressure Gauge for general purpose is manufactured within the country and mostly by the small scale sector. For special applications, these are imported and offer scope for the manufacture, though the requirements of such pressure Gauges is limited.

III. Quality Control and Standards

Since this is an item, the accuracy of which controls the ultimate process, it is of paramount importance that these are manufactured as per relevant Indian Standards Specification or as per specific requirements, I.S.S. No. 3624: 1966 deals with the pressure Gauges.

VI. Production Targets

12,000 Nos. Gauge per annum	Rs. 7,80,000.00
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IV. A. Manufacturing Process

(a) *Presumptions* . It is presumed that the following parts are to be procured from market.

1. Dial cover Glass
2. Castings of Brass/C.I./Gunmetal
3. Dial Plates printed
4. Springs
5. Phosphor Bronze or Beryllium Copper tubes of sizes and gauge as required.
6. Screws

(b) *Process* :

Process divides into the following sub-heads ;

1. Machining of cast components.
2. Press work for dial ring cover, indicator needle etc.
3. Machining of inlet nozzle, plugs for bourdon tube, level ; Rack and Gear Machinism etc.
4. Cutting to length and bending of tube.
5. Brazing the formed tube to inlet and plugs.
6. Assembly.
7. Testing and calibration.
8. Packing and despatch/storage.

V. (a) *Land*—Covered area of 350 sqm (rented) Rs. 500/-P.M.

(b) *Machinery & Equipment* :

1. High Speed production lathe Bar cap 32 mm. swing over slide 160 mm with chucking arrangements. PMT jude of UMS type 1.5 H.P.— 1 No. 35,000.00
 2. Capital Lathe bar cap 25 mm. swing over bed 200 mm 2 H. P.— 1 No. 60,000.00
 3. High speed precision lathe swing overbed 340 mm distance between centres 600 mm. 1 No. 35,000.00
 4. High speed precision drill 65 mm cap. with tapping attachments—1 H.P. 6,000.00
 5. Press, Non-gear type inclinable open back 10 tons 3 H.P.—1 No. 8,000.00
 6. Dip brazing equipment with vacuum attachments —1 No. 6,000.00
 7. Double ended bench grinders H.P. 1 No. 1,500.00
 8. Precision gear hobbing machine with plunge hobbing attachment & accessories coolant pump hobbing dia 63 mm Hobbing dia 24 mm Module 6 motor 1—H. 60,000.00
 9. Precision tube bending Machine motorised with tools to bend oval tubes max. cent line radius 150 mm with 25.4 mm dia tube max. capacity (32 mm 10 gauge) of P.H. bronze H.P. 5,000.00
 10. Precision measuring instruments 5,000.00
 11. Testing equipment for pressure, Vacuum Calibration unit with master test meters etc. 1/2 H.P 10,000.00
 12. Spray painting equipment with drying oven—motor complete, 1 H.P. 5,000.00
 13. Jigs, Fixtures and Tools and Furniture 5,000.00
 14. Erection and commissioning @ 10% machine cost 23,100.00
- | | |
|---------|-------------|
| | 2,64,600.00 |
| Say Rs. | 2,65,000.00 |

VI. Raw Materials and Bought out Components

(a) *Phosphor Brone or Beryllium* :

- | | |
|--|-----------|
| Copper tubes of size as required 75 Kgs. @30/- kg. | 2,225.00 |
| M. S. Sheet 24 to 26 gauge 120 kgs@ Rs.6/- | 720.00 |
| Brass rod 60/40 assorted sizes 400 kg. @ Rs. 25/- kg. | 10,000.00 |
| Steel Rods free machining 100 Kg@ 2.00 kg. 3mm & 6.5 mm. | 200.00 |
| | 13,170.00 |
| Say Rs. 13,100/- | |

(b) Boughtout Components		Rs.
1. Springs of sizes (average Rs. 0.50 per meter)		500.00
2. Screws of sizes (average Re. 1/- per meter)		1,000.00
3. Dial cover glass 1100 nos. (allowing 10% broken @ Re. 1/- per glass)		1,100.00
4. Dial plates printed 1000 nos. @ Rs. 1/50 meter		1,500.00
5. C. I/Brass/Gun metal casting (at an average of Rs. 15 per pc) Nos. (5% for rejection etc. due to machining defects etc.)		15,750.00
		<u>19,850.00</u>

(c) Indirect Materials such as :

Lubricants cotton waste, consumables	500.00
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VII. Staff :

(a) Administration :

1. Manager—1—1000/- Rs. p.m.	1,000.00
2. Supervisors—2—Rs. 400/-	800.00
3. Inspector/Calibration—2—350/-	700.00
4. Storekeeper/Clerk—Rs 300/-	300.00
5. Chowkidar—1—Rs. 200/-	200.00
	<u>3,000.00</u>

(d) Technical :

Skilled workers Nos. 4 @ Rs. 350/-	1,400.00
Semi skilled workers—3 nos @ Rs. 300/-	900.00
Helpers—4, @ Rs. 200/-	800.00
Assembly staff—3 nos. @ Rs. 250/-	750.00
Packing asstt.—1,200/-	
	<u>4,050.00</u>

(e) Labour Welfare Other Expenses :

Other expenses	1,215.00
Power and water	800.00
Repairs and Maintenance	400.00
Stores Consumables	200.00
Stamps and Stationery	150.00
Insurance	350.00
Transportation Charges	300.00
Packing	350.00
	<u>2,550.00</u>

VIII. Working Capital for one months :

Rent	500.00
Raw Materials and Bought out components	33,450.00
Salary and Staff Welfare	8,265.00
Utility	800.00
Other overheads	2,550.00
	<u>45,565.00</u>

IX. Working Capital for 3 months

$45,565 \times 3 =$	1,36,695.00
Say Rs.	<u>1,37,000.00</u>

X Total Investment

	Rs.
Machinery & Equipment	2,65,000.00
Working Capital for 3 months	1,36,695.00
	<u>4,01,695.00</u>

Say Rs. 4,02,000.00

XI. Cost of Production per month

1. Working Capital	45,565.00
2. Depreciation on machinery @ 10%	2,208.00
3. Interest on capital investment @ 15%	5,000.00
	<u>52,773.00</u>

XII. Turnover by sales (Excluding Commission):

By sale of 1,000 pressure gauges @ Rs. 65/- each 65,000.00

XIII. Profitability :

1. Profit : Sales—cost of production: Rs. 65,000.00 @ Rs. 52,700 = 12,300.00	
	$\text{Rs. } 12,300 \times 100$
2. Percentage profit on sales	$\frac{\text{Rs. } 12,300 \times 100}{\text{Rs. } 65,000.00} = 18.9\%$
	$\text{Rs. } 12,300 \times 100$
3. Percentage profit on return	$\frac{\text{Rs. } 12,300 \times 100}{\text{Rs. } 4,01,695} = 36.7\%$

XIV. Break Even Analysis

Fixed Cost

1. Interest	5,200.00
2. Depreciation	2,208.00
3. Rent	500.00
4. 40% other expenses	1,340.00
5. 40% staff expenses	3,286.00
	<u>Total</u>
	12,334.00

B.E.P.	$\frac{\text{Fixed cost} \times 100}{\text{Fixed cost} \times \text{profit}}$
	$\frac{\text{Rs. } 12,334 \times 100}{\text{Rs. } 12,334 \times 12,000} = 50\%$

XV. Addresses of Machinery and Equipment Suppliers :

- M/s Industrial & Agricultural Engg. Co. (Bom) Ltd.
43, Dr. V. B. Gandhi Marg.
Fort Bombay-400023
- M/ Daulat Industrial Corporation Pvt. Ltd.
Civil Lines Ludhiana.
- M/s Albert Herbert (India) Ltd.
13/3 Strand Road Calcutta 700001
- M/s Perfect Machine Tools Co. Ltd.
Bell Building,
Sir P. M. Road Bombay-400001
- M/s Acro Whitney,
Akurdi Road,
Chinch Wad Poona-111019.
- M/s Singhal Engineering Works
Bapu Marg Aligarh.
- M/s Ametee Machine Tools Pvt. Ltd.
14/7 Mathura Road
Faridabad (Haryana)

(Reserved item Sl. No. 789)

I. Product and its uses

Under the class of heating appliances used for Domestic purposes and in hotels, the common Kerosene Pressure Stove is still largely used by middle class people in small towns and cities. This is a via-media between charcoal, firewood and gas stoves.

Oil pressure stoves under normal working pressure of 1 to 2 kg/cm are available in different designs as portable stoves with tube burner and legs detachable, minimum fuel cap 500 ml to 900 ml. known as commercial camp stove No. 14, No. 100. They are also available with roarer type burners, silencer type burners, etc. The main important parts of the stove are fuel container, burner, flame ring, nipple, outer cap, wire guaze, top ring, and pumping plunge and piston.

This profile envisages the manufacture of oil pressure stove with burner-assembly procured from outside and all the other parts are manufactured and assembled in the unit.

Market Potential: With the general advancement, the usage of pressure stoves with masses will pick up and thus there would be need to provide them with these cooking aids, among which pressure stove is perhaps the first to come. There is generally good scope for this item if consistent quality is maintained.

II. Production Target (per annum)

(a) Quantity	14,400 Nos.
(b) Value (Rs.)	7,92,000.00

III. Production Details and Process of Manufacture**(i) Process Outline**

(a) **Fuel container:** Brass sheet conforming to alloy designation Cu-Zn 37 annealed, to IS: 410-1967 is used, and pressed out bottom body and top and are brazed with brazing metal having a high melting point say 800° to 850° C Burner fixing nut, made of brass is brazed to the neck of the body container.

(b) **Outer-cup:** for silencer type burner heat resisting steel to designation 07 of IS: 1576-1961 is used and pressed out.

(c) **Tube type burner of Nickel-Silver** with burner head got stamped, brazed with frame ring and nipple of IS: 410-1967 is used which may be purchased from outside.

(d) Burner plate of grey cast iron Gr. 15 IS: 210-1962 may also be purchased from outside.

(e) Wire gauze of brass, wire gauze 0.180 to 0.25 m wire dia may be purchased from outside.

(f) **Top ring**—MS sheet conforming to IS: 513-1963 may be used and pressed out.

(g) Pump plunger rod and piston made of MS rod fitted with leather washer, retainer and knob turned from brass rod.

(h) Legs. MS Rod bent to shape.

(i) All parts are assembled.

IV. Quality Control Standards

Product standard IS: No. IS: 1342

1968 may be followed and the stove is subjected to pressure test for a working pressure of 2 kg./cm.

V. Land and Building :

Qty. Amount
(in Rs.)

Built up area (rented) 60' x 40'—2,400sq ft. 600.00 (p.m.)

VI. Machinery and Equipment :

1. Treadle guillotine shearing machine 4 foot wide—22 Kwg	one	5,000.00
2. Toggle type deep drawing press No. 5- 75 tons cap—	one	60,000.00
3. Capstan Lathe, Bar cap 35 mm— "Peno- mat" or similar	one	20,000.00
4. Gas weldings set complete with torches set LOC make or similar	one	3,000.00
5. Fly Press No. 6	one	1,200.00
6. Double ended bench grinder 8" wheel dia	one	1,200.00
7. Pedestal type drilling machine 3/4" cap	one	3,000.00
8. Buffing spindle double ended with motor and starter	one	2,000.00
9. Hand shear, hand tools, measuring instru- ments pressure, test bench with pressure gauge and compressor etc. (lumpsum)		7,500.00
10. Dies, jigs and fixtures (lumpsum)		6,500.00
11. Erection and installation		5,000.00
12. Centre lathe Ht. of centres 4' length Bed— 3 ft.		10,000.00
		1,24,400.00

VII. Raw Materials (Per month)

Sl. No.	Particulars	Import ed Indege- nous	Qty.	Rate	Value (Rs.)
1	2	3	4	5	6
1	Tube type burner complete	Indege- nous	1200 Nos.	10/-	12,000·00
2	M.S. Sheet 0·8 mm thickness	„	250 kg	4000 p. ton	1,000·00
3	Bright drawn MS Rod 6 mm to 8 mm	„	250 kg	3000 p. ton	750·00
4	Brass Rods 12 mm to 18 mm dia and 25 rods	„	250 kg	22000p. ton	5,500·00
5	Brass Sheet IS : 410 : 1967	„	750kg	26000 p. ton	19,500·00
					38,750·00

XIII. Staff & Labour (per month)

Administrative & Supervisory

1. Manager	one	850·00
2. Supervisor	one	600·00
3. Storekeeper-cum-Clerk	one	450·00
4. Inspector	one	450·00
		2,350·00

Technical (Skilled & Unskilled)

1. Skilled operators	6	2,400·00
2. Semi-skilled	3	900·00
3. Helpers	1	150·00
4. Watchman	1	150·00
Total		3,600·00

Total of Salaries 5,950·00

plus prerequisite @ 15%

900·00
6,850·00

X. Other Expenses :

(i) Power and water	(Rs.)
(ii) Postage & Stationery	300·00
(iii) Rent	300·00
(iv) Telephone	600·00
(v) Consumable stores (such as soldering, welding gas, polishing materials, cutting tools, etc.)	200·00
2,000·00	

Amount

	Amount
(vi) Repairs & Maintenance	
(vii) Transport charges	250·00
(viii) Advertisement & Publicity	300·00
(ix) Insurance	250·00
(x) Taxes	150·00
(xi) Sales expenses	200·00
(xii) Miscellaneous expenses, (such as leather waste, packing material etc.)	300·00
Total	500·00
	5,350·00

X. Working Capital (For 3 Months)

	Rs.
1. Raw material	1,16,250·00
2. Salaries of Staff and labour	20,550·00
3. Other expenses	16,050·00
Total	1,52,850·00

XI. Total Capital Investment :

(i) Machinery and Equipment	1,24,400·00
(ii) Working Capital	1,52,850·00
2,77,250·00	

XII. Cost of Production (per annum)

Total recurring cost per year	6,11,400·00
Depreciation on Machinery & Equipment @ 10%	12,440·00
Interest on total investment @ 15%	27,725·00
Total	6,51,565·00

XIII. Sales Proceeds

Sl. No.	Item	Quantity	Rate	Value
1	2	3	4	5
		Nos.	@Rs.	Rs.
1.	Camp stove No. 100 portable with tube type burner with legs detachable—900 ml cap.	7,200	50	3,60,000·00
2.	Stove No. 11, portable with silencer burner with legs fixed on to contain 1200 ml.	7,200	60	4,32,000·00
Total				7,92,000·00

XIV. Profitability (Before Income Tax)	7,92,000·00
	(—) 6,51,565·00
	1,40,435·00

% age of profit over sales :

$$\begin{aligned} & \frac{\text{Net profit per year} \times 100}{\text{Total investment}} \\ & = \frac{1,40,435 \times 100}{2,77,250} \\ & = 17\cdot7\% \end{aligned}$$

Turnover per year 52·7% Approximately

XV. Break even Analysis (% of total production envisaged)

(i) Fixed Cost (Annual)	
(a) Depreciation on machinery & equipment	12,440·00
(b) Rent on building	7,200·00
(c) Interest on total investment	27,725·00
(d) Insurances	1,800·00
(e) 40% salary & wages	32,880·00
(f) 40% other contingent expenses	20,640·00
Total	1,03,685·00

(ii) B.E.P.

$$\frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Sales} - \text{Annual variable cost}} = 50\%$$
$$\frac{103685 \times 100}{792000 - 5,84,900} = 50\%$$

XVI. Suppliers of Machinery & Equipment :

- 1. M/s. Perfect Machine Tools Pvt. Ltd.,
6, Bell Buildings,
Sir, P.M. Road,
BOMBAY

- 2. M/s. Batliboi & Co.,
Forbes Street,
Fort, BOMBAY.
- 3. M/s. Quality Machine Tools Pvt. Ltd.,
V.V. Puram,
BANGALORE.
- 4. M/s. Maneklal & Son,
Naryanan Das Street,
BOMBAY.
- 5. M/s. Datta Engineering Works,
Teliwara, DELHI.
- 6. M/s. Elgi Pvt. Ltd.,
COIMBATORE.

(Reserved item Sl. No. 379).

I. Products and its uses

Projectors are used in the cinema industry, schools, colleges, and domestic purpose for projection of films for entertainment and educational purpose. Overhead projectors are used as training aids for projecting transparencies on to a screen.

(b) Market potential

There is great demand for these products as these are sold for new installations and in the replacement market. There is also a scope for exporting these items.

II. Production Target

16 mm projectors 600 nos.

8 mm projectors 186 nos.

35 mm projectors 96 nos.

Overhead Projectors 96 nos.

Value Rs. 910,585/-

III. Inspection and quality control

Inspection and Quality Control are done by conducting routine acceptance tests as per IS specification Nos. IS 4496/62, IS 4495/68 and IS 1302/1952 from 16 mm projectors and IS 6937—1973 for overhead projectors. There is no IS specification for 8 mm and 35 mm projectors.

The sound system is a separate part involving different techniques of manufacture and has not been included in the scheme.

IV. Production details and process of manufacture

The process of manufacture is mainly assembly work. The components are assembled in sub-assemblies and these sub-assemblies are assembled in the main assembly, tested and despatched. In this scheme some of the components are manufactured in the unit itself and the other items are bought from outside sources. The scheme envisages to produce 1000 nos. of assorted varieties of projectors and overhead projectors annually.

V. Land and Building :¹

	(Rupees)
(a) 150 sq. mtrs. land—Rs. 45/- per sq. mtr.	6,750.00
(b) Building (100 sq mtr. (or rented 1000 sq. m. Rs. 100/- per month	65,000.00
	<u>71,750.00</u>
Say. Rs.	72,000.00

Rs.

VI. Machinery and Equipment :

1. M.M. Make Harihar M. B. D. Lathe with Electricals	1 No.	15,000.00
2. M. K. Make Shimoga Lathe of different size with electricals	2 Nos.	40,000.00
3. Ha-user or equivalent Gear Hobbing, M/c for hobbing, small and large size gears	1 No. Imported	1,60,000.00
4. HMT Milling Machine with electricals;	1 No.	95,000.00
5. Pedestal Grinder 12" ϕ size	1 No.	2,000.00
6. Wolf Drilling M/c 1/2 ϕ	2 Nos.	1,000.00
7. Hacksaw M/c with motor and starter	1 No.	5,000.00
8. Shaping M/c 24" stroke with motor & starter	1 No.	15,000.00
9. Belt sanding & polishing M/c	1 No.	2,000.00
10. Tapping M/c 1/2" capacity	1 No.	10,000.00
11. 3/4" Pillar drilling M/c	1 No.	3,000.00
12. Dies, jigs, fixtures, tools, testing and checking instruments Lot		2,00,000.00
13. Office furniture & equipment		8,000.00
14. Installation charges		35,000.00
		<u>5,91,000.00</u>

Fixed capital

Land and building	72,000.00
Machinery & equipment	5,91,000.00
	<u>6,63,000.00</u>

VII. Raw Material per Month

Raw material and bought out items for projectors and overhead projectors, such as castings, spindles, rollers, gears, mate cross, cam, grate shoes, padding sprockets, picture grate sound drum, rotary stabilisers, picture frame, shutters, take off and take up magazine etc.

7,15,345.00

VIII. Staff & Labour (Per Month) :

1. Manager	1	2,000.00
2. Foreman	1	1,000.00
3. Engineers (Testing, Servicing)	3	1,800.00
4. Skilled workers	15	4,500.00
5. Typist-cum-clerk	1	500.00
6. Peon	1	200.00
7. Watchman	1	200.00
		<u>10,200.00</u>

Rs.

$$\text{Rate of Return} = \frac{110,585 \times 100 \times 12}{29,00,000} = 45.8\%$$

IX. Miscellaneous Expenditure (Per Month)

1. Power and Water and consumable stores	1,500.00
2. Postage & Telegram	500.00
3. Advertisement & Travelling	1,000.00
4. Packing and forwarding	3,000.00
5. Stationery	1,000.00
6. Unforeseen expenditure including maintenance	1,000.00
	<u>8,000.00</u>

X. Working Capital (per month)

1. Staff and Labour	10,200.00
2. Raw materials	7,15,345.00
3. Misc. Expenditure	8,000.00
	<u>7,33,545.00</u>
Say Rs.	<u>7,34,000.00</u>

XI. Total Capital Investment

1. Fixed capital	6,63,000.00
2. Working Capital for 3 months	22,02,000.00
	<u>28,65,000.00</u>
Rs. Rs.	<u>29,00,000.00</u>
	(Rupees)

XII. Cost of Production (Per month)

1. Working Capital	7,34,000.00
2. Depreciation on M/c & Equipment @ 10%	4,900.00
3. Depreciation on building @ 5%	270.00
4. Interest on total investment @ 15%	38,000.00
	<u>Total 7,77,170.00</u>
	Say Rs. 8,00,000.00

XIII. Sales Proceeds (Per Month)

By sale of projection and overhead projectors	
16 mm 50 Nos. @ 8150/-	} 9,10,585.00
8 mm 15 Nos. @ Rs. 5275/-	
35 mm 8 Nos. @ Rs. 50,000/-	
Overhead projectors 8 Nos. @ Rs. 2995/-	

XIV. Profitability

$$\begin{aligned} \text{Sales} - \text{Cost of production} &= \text{Profit} \\ 210,585 - 800,000 &= 110,585 \text{ per month} \\ \text{percentage of profit over sales} &= \frac{110,585 \times 100}{910,585} = 12.14\% \end{aligned}$$

XV. Break Even Analysis :

$$\begin{aligned} \text{B.E.P.} &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\ &= \frac{53,370 \times 100}{53,370 + 110,585} = 32.55\% \end{aligned}$$

XVI. Names and Addresses of Machinery and Equipment Suppliers

1. M/s. H. M. T., 9, N. S. Patkar Marg, Bombay 36.
2. M/s. Leading Engineering Works, 31, Rohtak Road, NEW DELHI.
3. M/s. United Machine Tools Corporation, G. T. Road, Dholewal, LUDHIANA.
4. M/s. Cooper Engineering Ltd., Chinchwad (M.S.)
5. M/s. Orient General Industries, 59, Industrial Estate, Sector 6, FARIDABAD (Haryana)
6. M/s. India Machinery Ltd., 29, Strand Road, CALCUTTA.
7. M/s. Sardar Foundry (Regd.) Cinema Road, BATALA.
8. M/s. Soner Machine Tools, 10, Industrial Estate, RAJKOT.
9. M/s. Indian Turnomat Industries, Industrial Area 'B' LUDHIANA.

XVII. Names and Address of Raw Material Suppliers :

1. Sanjay Steel Corporation, 81/83, Ist Parsiwala Lane, Mani Bhavan, BOMBAY 400004.
2. Shuja Metal Centre 55/57, Naihuda Street, BOMBAY-400009.
3. Aultra Trading Co., 17, Gupta House, 2nd Marine Street, BOMBAY-400002.
4. B.F.G. Steel Co., Alankar Theatres 3rd Floor, Room No. 14, S.V.P. Road, BOMBAY-400004.

(Reserved item Sl. No. 794)

I. Product and its uses

The pullers are commonly known as pulle pullers, gear pullers or bearing pullers. The pullers are used for removing pulleys, fly wheel bearings or other discs from the shafts without injuring the shaft or the pulley. Different sizes of pullers are required for different type of work.

The pullers have two or three legs and are made out of mild steel. Every industrial unit keeps it for maintenance purpose.

II. Production Target

It is proposed to manufacture 300 Nos. of pullers of assorted size, whereas the installed capacity will be 450 per shift.

III. Production details and Manufacturing Process

The legs flats are cut to length and the ends are forged. The screw is turned on lathe machine. The top plate is machined on shaper and, threads cut for guiding the screw. The parts are finally assembled.

IV. Inspection and Quality Control

The pulley pullers only require the dimensional checking for which measuring instruments are needed. So the vernier calliper, micrometer, thread gauges, calipers etc. have been incorporated in the scheme.

V. Land and Building

	Rs.
Covered area 150 sq. metres (rented)	1,500.00

VI. Machinery and Equipment

1. SS & SC Lathe, Ht. of crs 190 mm, dist. between crs 1000 mm, complete with standard accessories and electricals and motor 1 H.P.	1 No.	16000.00
2. Power Hacksaw 2' to suit 100 dia with motor $\frac{1}{2}$ H.P.	1 No.	3,500.00
3. Shaping machine 24" stroke with electricals and motor 2 H.P.	1 No.	18,000.00
4. DE Bench Grinder wheel size 250 x 25, 1 H.P.	1 No.	1,500.00
5. Bench Drilling machine 12 mm cap., with $\frac{1}{2}$ H.P. motor	1 No.	2,500.00
6. Open hearth furnace (coal fired) complete with blower $\frac{1}{2}$ H.P.	1 No.	1,500.00
7. Measuring instruments and hand tools.		2,000.00
8. Electrification and installation charges.		4,000.00
Total cost of machinery.		49,000.00

9. Cost of office equipment, work benches etc.	Rs.
	5,000.00
Total	54,000.00

VII. Raw Material (per month)

(i) M.S. flats and rounds of various sizes.	2 M.T.	5,000.00
(ii) Consumables as coal, rivets, waste cotton, lubricants etc.		1,000.00
		6,000.00

VIII. Staff and Labour (per month)

1. Manager-cum-Production Engineer.	1	1,000.00
2. Accountant-cum-Office Assistant	1	300.00
3. Watchman	1	200.00
4. Skilled Workers	3	900.00
5. Unskilled workers	2	400.00
		2,800.00
(+) Perquisites 15%		420.00
		3,220.00
	Say	3,200.00

IX. Other Expenses (per month)

1. Electricity and power.	150.00
2. Rent.	1,500.00
3. Postage and stationery	50.00
4. Transport charges	50.00
5. Insurance etc.	90.00
6. Sales expenses	200.00
	2,040.00

X. Working Capital (per month)

1. Raw material	6,000.00
2. Staff & labour	3,200.00
3. Other expenses	2,040.00
	11,240.00
Working Capital for 3 months.	33,720.00
Say	33,700.00

XI. Total Capital Investment

1. Fixed Capital	54,000.00
2. Working Capital (3 months)	33,700.00
	87,700.00

XII Cost of Production (per annum)

1. Raw materials ^v	72,000.00
2. Salaries.	38,400.00
3. Other expenses	24,480.00
4. Interest	13,140.00
5. Depreciation @ 10%	5,400.00
Total cost of production	1,53,420.00
Say	1,55,000.00

XIII. TOTAL SALE (per annum)

By sale of 3,000 pullers of assorted size at an average rate of Rs. 50/-per piece. 1,80,000.00

XIV. Profitability (per annum)

Total sale	Cost of Production	Profit
1,80,000—1,55,000		25,000
(a) Percentage of Profit on sale	$\frac{25,000 \times 100}{1,80,000}$	=14%
(b) Percentage of return	$\frac{25,000 \times 100}{87,700}$	=29%

XV. Break even Analysis

$$BEP = \frac{\text{Annual fixed cost} \times 100}{(\text{Fixed cost} + \text{Profit})}$$

Fixed cost (per annum)

	Rs.
1. Rent	18,000.00
2. Interest	13,140.00
3. Depreciation on machinery	5,400.00
4. 40% of salaries	15,360.00
5. 40% of other expenses	9,800.00
	61,700.00

$$BEP = \frac{61,700 \times 100}{61,700 + 25,000} = 71 \times \frac{2}{3} = 48\%$$

Addresses of Machinery Suppliers

1. M/s. Perfect Machine Tools,
44E, Connaught Place,
New Delhi-110001.
2. M/s. Chanana Brothers,
26, Okhla Industrial Estate,
New Delhi-110020.
3. M/s. Moson Engineering Works,
61, Shardhanand Marg,
Delhi-110006.
4. M/s. Mahalaxmi Engineering Works,
27, DLF Industiral Area,
Shivaji Marg,
New Delhi-110015.

(Reserved item Sl. No. 664).

I. Product and Its Uses

The racks are made of steel sheets and angles, and have shelves to permit storing of articles. These racks are used in households, Offices, Business establishments for various purposes. These are different types of Racks. The rack may be classified as:

- (1) Open type Rack.
- (2) Semi-open type Rack.
- (3) Closed type Rack.

In the open type rack, the rack consists of angles, shelves without back and sides. In the semi-open type rack either of the back or sides are closed with sheets but not both. In the closed type Rack both back and sides are closed. In this project profile for the purposes of working out economics only the open type racks are taken into account. If the other types are required by the customers the same may be supplied by the unit at additional cost after adding the required material and labour costs.

II. Market Potential

As these racks are required by officers, business establishments etc. their demand increases every year. The demand for open type racks are more than that of the other types. The demand for the racks exists in big cities as well as in small towns. As the manufacturing process is not very complicated and requires less technical supervision, the promoters of the unit can concentrate more in vigorous market drive.

III. Production Target

It is proposed to manufacture 100 Nos. of open type racks per month.

IV. Production details and Process of Manufacture

The angles are cut to length by lever shear. The sheets are also cut to size by lever shear and folded to shelf shape with sheet bending and folding machine. The drilling is done wherever necessary. The various members are painted and backed in the storing chamber.

V. Inspection and Quality Control

All burrs and sharp edges shall be removed from various components. The finish shall be smooth uniformly applied and free from visible defects.

VI. Land and Building

	Rs.
Covered area : 200 sq. meters rented;	1,000.00

VII. Machinery and Equipment

(1) Sheet bending and folding machine 4'.	1 No.	8,500.00
(2) Bench drill $\frac{1}{2}$ " cap.	1 No.	1,500.00
(3) Bench grinder.	1 No.	1,500.00
(4) Air compressor with spray painting gun.	1 No.	3,000.00
(5) Hand lever shear 12".	1 No.	850.00
(6) Stoving oven 6' x 6" x 8' (locally fabricated).	1 No.	10,000.00
(7) Measuring, Marking & hand tools.		5,000.00
(8) Office furniture & equipment		2,150.00
(9) Installation and electrification		2,500.00
Total		35,000.00

VIII. Raw Material (per month)

(1) Angle Iron 36 mm x 36 mm x 5 x 5 mm 2500 ft.	4,000.00
(2) B.P. Sheet 18 to 20 swg. 3 Tons.	12,000.00
Total	16,000.00

IX. Staff and Labour (per month)

(1) Skilled workers	1 No.	400.00
(2) Semi-skilled workers	1 No.	250.00
(3) Helpers	2 Nos.	400.00
(4) Office staff	1 No.	300.00
(5) Welfare Facilities for staff		250.00
Total		1,600.00

X. Other Expenses (per month)

(1) Rent	1,000.00
(2) Electricity & water	360.00
(3) Consumable stores, paints etc.	2,800.00
(4) Cartage	300.00
(5) packing cost	100.00
(6) Publicity	200.00
(7) Sales expenses including travelling;	400.00
(8) Stationery, postage & misc. expenses	240.00
Total	5,900.00

XI. Working Capital (per month)

	Rs.
(1) Raw material.	16,000.00
(2) Staff and Labour.	1,600.00
(3) Other expenses.	5,900.00
Total	23,500.00

XII. Total Capital investment

(1) Machinery & equipment.	35,000.00
(2) Working capital for 3 months	70,500.00
Total	1,05,500.00
Say	1,06,000.00

XIII. Manufacturing Cost (per month)

(1) Raw material.	16,000.00
(2) Staff & labour	1,600.00
(3) Other expenses.	5,900.00
(4) Depreciation on machine at 10% per annum.	292.00
(5) Interest on capital investment at 15% p.a.	1,325.00
Total	25,117.00
Say	25,000.00

XIV. Total Sales (per month)

By sale of 100 Nos. of Racks at Rs. 280/- each.	28,000.00
---	-----------

XV. Total Profit (per month)

Profit=Total sales per month—Manufacturing cost per month.	
=28000—25000	
=Rs. 3000.00	
Annual profit=Rs. 3,000×12	
=Rs. 36,000.00	

(a) Percentage of profit on sales.	
Profit per month	
Sales per month	
3000	
= ————— × 100	
28000	
= 10.7%	

(b) Percentage of profit on total capital investment:—	
Profit per annum	
Total investment	
= ————— × 100	

Rx.

$$= \frac{36000}{1,06,000} \times 100$$
$$= 34\%$$

XVI. Break even analysis

$$\text{Break even percentage} = \frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100$$

Fixed Cost per month

	Rs.
(1) Rent.	1,000.00
(2) 40% of staff & labour.	640.00
(3) 40% of other expenses, excluding rent.	1,960.00
(4) Depreciation on machine & equipment.	292.00
(5) Interest on capital investment.	1,325.00
Total	5,217.00
Say	5,200.00

$$\text{Annual fixed cost} = \text{Rs. } 5200 \times 12$$
$$= \text{Rs. } 62400.00$$
$$\text{Break even percentage} = \frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100$$
$$= \frac{62400}{62400 + 36000} \times 100$$
$$= \frac{62400}{98400} \times 100$$
$$= 63.4\%$$

XVII. Name and Addresses of Suppliers of Machinery and Equipment

- (1) Machine Tools Traders (Calcutta), 25, Ganesh Chandra Avenue, Calcutta-700013.
- (2) Machine Bazar, 130, Meadows Street, Fort, Bombay-400023.
- (3) International Machine Tools Corporation, 5, Bank Street, Behind State Bank, Fort, Bombay-400023.

XVIII. Name and Address of Suppliers of Raw Materials

- (1) Any nearest branch of Steel Authority of India Ltd.

(Reserved item Sl. No. 400).

I. Product and Its Uses

The razors are used mainly by barbers for shaving. Although in general, middle class and lower middle class people are using safety razors, in rural areas some people are still using barber razors for shaving themselves.

II. Market Potential

This is a consumer item. For popularising the brand and pushing in the market some efforts and expenses are essential. For this reason provision of such expenses has been kept in the scheme. Hair Dressing Saloons are in the increase in cities and towns. As such demand is bound to increase regularly. At present, the rates of increase is around 10 per cent per annum.

III. Production Target

In this profile, calculations are based on an output of 12000 dozens per annum.

IV. Production details and Process of Manufacture

To keep down the cost of production, it is advisable to produce with worn out files obtained from disposals as scrap. These are available abundantly in the principal cities of all advanced States. Alternatively, Carbon Steel Flats of suitable sections are to be purchased. The cut blanks are worn out files are to be heated in open hearth. Forging is done in mechanical hammer to form to desired shape. Then the blades are trimmed in Power Press. After trimming profile form is rough finished by grinding and heat treated. Final finish is provided by grinding and lapping. Grinding wheels will be required to be dressed to the form. Anticorrosive lubricant is to be applied on blades after assembling with handles.

VI. Land and Building

The I. S. specification no. IS:888—1965 should be followed strictly to maintain Quality of production I.S.I. marked products are expected to find good market indigenously and there will be scope of exporting also.

VI. Land and Building

Covered area including working shed, office, stores etc. 300 metres @Rs. 5/- per sq. metre. 1,500.00p.m.

VII. Machinery and Equipments (All Indigenous)

		Rs.
(1) Forging hammer 150 kg. cap. ; complete with Elec. motor and anvil.		30,000.00
(2) Open hearth $2\frac{1}{2} \times 2\frac{1}{2}$ with Elect. Motor 1 HP & blower complete.	1	3,000.00
(3) Trimming press 60 tons cap. with Elect. motor 5 HP.	1	15,000.00
(4) Profile grinding special purpose machine.	2	30,000.00
(5) Oil fired hardening furnace $2' \times 1'$ (Muffle type) complete with pyrometer.	1	8,000.00
(6) Double ended buffing lathe motorised 1 HP each.	3	6,000.00
(7) Quenching tank with water jacket $4' \times 2' \times 2'$ with initial filling of quenching oil.	1	5,000.00
(8) Double ended bench grinder wheel size $12' \times 1'$	4	6,000.00
(9) Cost of disc for forging & trimming.	L.S.	5,000.00
(10) Drilling machine $\frac{1}{2}"$ Bench type with Elec. Motor 1 HP each.	2	5,000.00
(11) Hardness Testing Machine.	1	7,000.00
(12) Lathe machine 6 semi-norton Cap type with quick change gear box, Elec. Motor & other accessories.	1	16,000.00
(13) Shaper machine 24 cap. with Elec. motor 3 HP.	1	15,000.00
(14) Electrification & installation charges.		15,000.00
(15) Cost of office equipments & working table etc.		4,000.00
TOTAL COST OF MACHINERY & EQUIPMENTS		1,70,000.00

VIII. Salaries and Wages

(1) Manager @ Rs. 1000/-PM.	1	1,000.00
(2) Foreman @ Rs. 800/-PM.	1	800.00
(3) Inspector @ Rs. 500/-PM.	1	500.00
(4) Accountant @ Rs. 500/-PM.	1	500.00
(5) Clerk-cum-typist @ Rs. 400/-PM.	1	400.00
(6) Store Keeper @ Rs. 400/-PM.	1	400.00
(7) Peon-cum-chowkidar @ Rs. 250/-PM.	2	500.00
(8) Skilled worker @ Rs. 400/-PM.	5	2,000.00
(9) Semi-skilled worker @ Rs. 250/-PM.	4	1,000.00
(10) Unskilled worker @ Rs. 250/-PM.	7	1,750.00
(11) Labour amenities.		1,250.00
		10,100.00

IX. Raw material including packing requirements per month

(All indigenous)

1. High Carbon Steel flat 3 mm thick Rs. 6,000 per ton (For calculation the weight of each razor blade has been considered as 100 gms and wastage 5% by way of rejection).	1260kg.	1,560·00
2. Card board boxes, polythin rappers wooden boxes.	L.S.	2,400·00
3. Razor handles rivetting pin etc. to be bought out from the market.	L.S.	12,000·00
4. Steam Coal @ Rs. 450/- per ton for 2·5 tons.		1,125·00
5. Furnace oil @ 1/10 per lit. for 600 lit.		5660·00
		<u>23,745·00</u>

X. Other Expenses (per month)

1. Rent.	1,500·00
2. Contingencies.	400·00
3. Consumable stores.	1,500·00
4. Maintenance & replacement of tools.	400·00
5. Transport & Travelling.	800·00
6. Marketing expenses.	1,000·00
7. Power & Electricity.	400·00
	<u>6,000·00</u>

XI. Working Capital (For 3 months recurring)

$$3 \times (\text{VII} + \text{IX} + \text{X}) = 3 \times 39845 = \text{Rs. } 1,19,535/-$$

XII. Capital Investment

1. Fixed.	31,70,000·00
2. Working.	1,19,535·00
	<u>2,89,535·00</u>

XIII. Cost of production per annum

1. Total recurring cost per annum.	4,78,140·00
2. Depre. on M/c. & Equipment @ 10%.	17,000·00
3. Interest on total investment @ 15%	43,430·00
Total	<u>5,38,570·00</u>

XIV. Sales Proceeds (Annual)

By sale of Hollow ground razor open type 12,000 doz. @ Rs. 60/- per doz.	7,20,000·00
--	-------------

XV. Profitability (Before taxes)

Net profit per year is XII—XII	1,81,430·00
The profit is 25·2% of sales.	

XVI. Break Even Analysis

1. Depreciation of machinery.	17,000·00
2. Interest on capital.	43,430·00
3. Rent.	18,000·00
4. 40% of salaries & wages.	48,480·00
5. 40% of other expenses.	21,600·00
	<u>1,48,510·00</u>

$$\text{B.E.P.} = \frac{\text{Fixed cost} \times 100 = 14,85,1000}{\text{Fixed cost} + \text{Profit}; = 329940}$$

(8) Suppliers of Raw Material

1. M/s. Steelera Corpn., 145, Narayan Dhuru Street, Bombay-3.
2. M/s. Firth Sterling Steel Co. India Ltd., Sah b Building 195, D.N. Road, Bombay-1
3. M/s. Rath & Sons, 82 Nagdevi Cross Lane, Bombay-3.
4. M/s. Hindustan Metal & Engng. Co, 8/10, 2nd Carpenter Street, Bombay-4.
5. M/s. Teedee Steel Corpn., 84, Memonwada, Bombay-3. (BR).
6. M/s. New India Steel & Engg. Co., 185, Sheikh Memon Street, Bombay-2.

Machine Tools

1. M/s. Hindustan Machine Tools, 132, Mount Road, Madras-6.
2. M/s. Perfect Machine Tools Co. Ltd., 123, Mount Road, Madras-6.
3. M/s. Batliboi & Co. (P) Ltd., 190 A Forbes Street, Fort, Bombay-400001.
4. M/s. Quality Machine Tools, 164-B, Industrial Estate Ludhiana.
5. M/s. Atlas Engg. Industries, G.T. Road, Batala.

Heat Treatment Equipment

1. M/s. Indian Furnace Co. (P) Ltd., 12-A, Dr. Annie Besant Road, Worli, Bombay-18.
2. M/s. Bagsvig Heat Treatment Equipment, 150-A/2, Mount Road, Madras-1.
3. M/s. Pioneer Equipment Co., P.O. Box No. 1909 Bombay-1.

Forging Hammers

1. M/s. Alfred Herbert India (P) Ltd., Dare house, Madras-1.
2. Francis Klein & Co., 1, Royal Exchange Place, Calcutta.
3. M/s. New Standard Engg. Co., Carrol Road Bombay-13.

Hardness Testing Machine

1. M/s. Blue Star Ltd., 21, Feroz Gandhi Road, Lajpat Nagar, New Delhi.
2. M/s. Fuel Injection Equipment, Ichal Karanji, Maharashtra State.
3. M/s. Testing Machinery Corpn. 51/53, Nagdevi Cross Lane, Bombay-2.

(Reserved item Sl. No. 484).

I. Product and its uses

Reapers are harvesting machines required by agricultural farms. These are self-dumping equipment for reaping grain crop straw and laying it in batches for binding into sheafs. The principal parts of the machine are: the frame, the main driving and free wheels, the platform, the dividers, the cutter bar, the raking apparatus, the counter, the transmission gears, the platform lifting and lowering mechanism and harnessing arrangement.

The reaper frame is made of cast iron, it is mounted on the driving wheel by means of mounting yoke of the main axle. On the frame, driving gears are placed. At the right side of the frame, the platform is hinged together with cutter bar and with two inside and outside dividers. On the frame, raking apparatus which has five rakes for dumping the grain batches from platform, is fastened. The rake changing over for grain batches dumping is performed by means of a special mechanism a counter, which can be adjusted for dumping batches by every next rake or by every second or third or fourth rake. The cutter bar of conventional type cutting consists of guard finger bar and a knife. The drive of the cutter bar knife is accomplished from the driving wheel through gears.

Reapers may be operated by animal drive or engine drive.

II. Market Potential

Gradually mechanisation of farm operations are developing in the country. Substitution of human labour during harvesting time is now-a-days felt necessary as harvesting period is required to be minimised. At present manufacture of this item in the country is negligible. But it is expected that demand for farm implements and machinery will grow at fast pace. So, the units which will start operations earlier will have better marketing scope. Manufacturing units with the machines given in this profile will be able to cater to multipurpose requirements in growth centres.

III. Production Target

The profile has been estimated on the basis of production and sales of 8 nos. of Reapers per month.

IV. Production Details and Methods of Manufacture:

The castings, gears and the specialised components will have to be purchased from outside. The

production shop should have facilities for general fabrication machines, welding and assembly shop. The engines wherever are to be fitted are to be procured from Petrol Engine manufacturers as a special item. Therefore, in this profile, engine prices are not accounted for. Prices for engines will have to be charged extra.

V. Quality Control and Standard

There is no I.S.I. Specification for this item. Care is to be taken in construction and after sales service, keeping in view the habits of negligence by our farmers to the proper maintenance of machines, when not in use. Guidance leaflets should be provided along with the product to provide proper guidance in storing during the off season periods and maintenance procedures.

VI. Land and Building

	Rs.
100 Square metres covered area @Rs. 5/- per square metre per month, to be rented.	500.00

VII. Machinery And Equipment

1. S.S.S. C. Lathe 6'-0" with accessories.	17,000.00
2. 24" stroke shaping machine.	15,000.00
3. 3/4" Capa. Drill M/c.	3,000.00
4. Metal cutting Hacksaw M/c.	5,000.00
5. Pedestal Grinder.	1,500.00
6. Welding machine 300 amps.	4,500.00
7. Fitter's Bench vise, hand tools etc.	4,000.00
8. Furnitures and office equipment.	5,000.00
9. Installation, electrification.	5,000.00
	60,000.00

VIII. Salaries and Wages (Monthly)

1. Supervisor.	1,000.00
2. Clerk-cum-Storekeeper.	500.00
3. Skilled workers @Rs. 400 p.m. —4 nos.	1,600.00
4. Semi-skilled workers @ Rs. 250 p.m. —4 nos.	1,000.00
5. Unskilled workers @ Rs. 200 p.m. —2 nos.	400.00
6. Watchman-cum-Peons @ Rs. 250 p.m.	500.00
7. Labour amenities.	1,000.00
	6,000.00

IX Raw Materials (Monthly)

1. M.S. Sheets, rods and other sections 1·6 M.T. @ Rs. 3/- per K.G.	4,800·00
2. C.I. Castings 1·2 M.T. @ Rs. 3/- per K.G.	3,600·00
3. C.S. Flats 200 Kg @ Rs. 10/- Kg.	2,000·00
4. Purchased components.	4,000·00
	<u>14,400·00</u>

X. Other Expenses (Monthly)

1. Rent.	500·00
2. Power and electricity.	250·00
3. Maintenance and replacement of small tools.	300·00
4. Consumable stores.	250·00
5. Transport and conveyance.	500·00
6. Contingencies.	300·00
	<u>2,100·00</u>

I. Working Capital (3 month's Recurring Expenses)

1. Salaries and wages.	₹ 18,000·00
2. Raw Materials.	₹ 43,200·00
3. Other expenses.	6,300·00
	<u>67,500·00</u>

XII. Capital Investment

1. Fixed.	₹ 60,000·00
2. Working.	₹ 67,500·00
	<u>1,27,500·00</u>

XIII. Cost of Production (Annual)

1. Salaries and wages.	72,000·00
2. Raw Materials.	1,72,800·00
3. Other expenses.	25,200·00
4. Depreciation of M/c. @ 10% per annum.	6,000·00
5. Interest on capital investment @ 15% per annum.	19,125·00
	<u>2,95,125·00</u>

XIV. Sales Proceeds (Annual)

By sales of 96 Reapers @ Rs. 3500 each. 3,36,000·00

XV. Profitability Before Charging taxes)

Profit = XIV - XIII = Rs. (336000 - 295125)
= Rs. 40875

The profit is 12% of sales and 32% of Capital Investment.

XVI. Break Even Analysis

1. Depreciation of machinery.	6,000·00
2. Interest on Capital Investment.	19,125·00
3. Rent.	6,000·00
4. 40% of Salaries and wages.	28,800·00
5. 40% of other expenses.	7,680·00
	<u>67,605·00</u>

$$\begin{aligned}
 \text{Break Even Point} &= \frac{\text{Net Fixed Cost} \times 100}{\text{Net Fixed Cost} + \text{Profit}} \\
 &= \frac{67605 \times 100}{67605 + 40875} \\
 &= \frac{6760500}{108480} \\
 &= 62\%
 \end{aligned}$$

XVII. Sources of Machinery

1. India Machinery Co.,
29 Strand Road, Calcutta-700001.
2. Regal Trading Co.,
Metabub Building, Tilak Road, Ahmedabad-380001.
3. International Machine Tools Corpn.
P.B. No. 799, Fort, Bombay-400023.

Reserved item S1. No. 505).

REAR VIEW MIRROR

I. Details and product and its uses

Rear view mirrors are used in Automobiles. The mirrors have a M.S. or Casting fittings which fit near the driver of a vehicle. Driver sees the rear view and backside view with the help of the rear-view mirror. It helps in safe driving and is a must for all light or heavy vehicles. With the increase of automobile population, these mirrors have good market potential. It is envisaged to product 1000 Nos. of rear view mirrors per month.

II. Land & Building

Total area: 500 sq. meter.

	Rs.
	5,000.00
Covered area: 200 sq. meter.	20,000.00
	<u>25,000.00</u>

III. Machinery and Equipment.

1. Power press 30 tons cap.	18,000.00
2. Bench drilling machine 1/2" cap 1	20,000.00
3. Lathe 4' Bed. Motor & Electricity.	8,000.00
4. Bench grinder 8" wheel 1.	2,000.00
5. Hand tools, press tools etc.	3,000.00
	<u>33,000.00</u>

Expenses toward electrification and installation etc. (10% of the cost of machinery).

	3,300.00
Furniture and office equipment.	1,700.00
	<u>38,000.00</u>

V. Raw material/Month (Single shift loses)

	Rs.
1. Glass/mirror 1000 nos. @ Rs. 1.80 per piece.	1,800.00
2. M.S. Sheets 10-11 gauge 120 kg. @ 14000/Ton.	480.00
3. M.S. Sheet 28-30 gauge 125 kg. @ 4200/Ton.	525.00
4. M.S. Rod 1/2" dia 75 kg. @Rs. 2/- kg.	150.00
5. Other hardwares	150.00
	<u>3,105.00</u>

V. Staff & Labour/Month.

		Rs.
1. Supervisor/Manager	1	400.00
2. Skilled Workers.	2	300.00
3. Unskilled Workers	3	400.00

VI. Other Expenses/month.

1. Power & water charges	200.00
2. Advertisement & traveling	150.00
3. Transport.	150.00
4. Maintenance, repair & renewal	150.00
5. Chromic plating charges	250.00
6. Other Contingencies	200.00

VII. Fixed capital

1. Machinery requirements	33,000.00
2. Land & Building	25,000.00
3. Furniture & Office equipment	1,700.00
4. Electrification & installation	3,300.00
	<u>63,000.00</u>

VIII. Working Capital month.

1. Raw material	3,105.00
2. Staff & Labour	1,350.00
3. Other expenses	1,100.00
	<u>5,555.00</u>

IX. Working capital for 3 months. (3 × 5555)

16,665.00

X. Total capital investmet

1. Fixed Capital	63,000.00
2. Working capital/3 months	16,665.00
	<u>79,665.00</u>

XI. Total cost of production/annum.

1. Working capital	66,660.00
2. Depreciation machinery & equipments @ 10%.	3,300.00
3. Depreciation on building @ 5%.	1,000.00
4. Depreciation on furniture and office equipments @ 15 %.	255.00
5. Interest on total investment @ prevailing rates 15%	11,949.00
	<u>83,164.00</u>

XII. Return by sale/annum.

By sale of $(1000 \times 12) = 12,000$ Rear
view mirrors @Rs. 9/- per mirror. . Rs. 1,08,000.00

XIII. Profit/annum

Return by sale. 1,08,000.00
(-) Cost of production: 83,164.00
Profits. 24,836.00

1. Profit on sales = $\frac{24836 \times 100}{108000}$
= 23%

2. Profit on capital investment = $\frac{24836 \times 100}{79665}$
= 31%

XIV. Break Even Analysis.

B.E.P. = $\frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$
= $\frac{28264 \times 100}{28264 + 24836} = 53.22\%$

XV. Machine Supplier's Addresses.

- | | |
|---|-------------------------------|
| 1. M/s. Channa Brothers,
24, Okhla Indl. Estate,
New Delhi-20. | } Lathe |
| 2. M/s. Beejay Industries (P) Ltd.
Bhandup Bombay. | |
| 3. M/s. Bharat Tools, E-36, Indl.
Estate, Jullundur. | |
| 4. M/s. Prem Engineering Works,
Okhla Indl. Estate, Okhla,
New Delhi-2. | } Power Presses |
| 5. M/s. Ameteep Machine Tools (P)
Ltd., Faridabad, Haryana. | |
| 6. M/s. Deccan Engineering Corpn.
Laxmipuri, Kolhapur. | } Bench drilling
Machines. |
| 2 M/s. Visalakshi & Co. Singanal-
ilur. Coi batore-5. | |

(Reserved item Sl. No. 639).

I. Introduction

A. Revolution Counters (Mechanically operated) is a small device which essentially forms a part in machine tools and industrial machinery as a counting device for counting of parts or pieces of items produced by the machine. This device is fitted on to the main machine and the spindle of the counter is connected to the driving part of the machine or cam spindle of the machine and number discs rotate and show the numbering on the window of the counter body or cover. The registered quantity will show the total number of pieces of items counted down during production.

The counters are generally of 5 digits and 6 digits numbering on the disc.

B. Market Potential: The demand for this item is gradually increasing with the increase in the special purpose machinery such as printing machines, duplicating machines, automatic paper conversion machine and pharmaceutical machines etc. Every machine of this type and nature is fitted with this instrument, namely Revolution Counter, which records the quantity in numbers registered by the counter mechanism numbered disc and show the figures in numbers. Apart from the requirement by original machinery manufacturers, it is also required for replacement.

II. Production Target

7800 Nos. Revolution Counters per annum Value Rs. 3,75,000/-.

III. Production detail and process of manufacture

The scheme envisages the manufacture of Revolution Counter-mechanically operated. The product consists mainly of—

- (1) Body or cover;
- (2) Bottom plate or frame;
- (3) Aluminium die cast disc number counters;
- (4) Main spindle and union spindle;
- (5) Indexing cam.

Body or Cover: This is generally made from sheet metal pressed (PCRC or Aluminium sheets) and the sight glass or flexiglass sheet is fitted or reading

the numbers. The cover is screwed to the bottom plate or frame of the counter mechanism and is black painted.

Frame or Bottom plate: This is a die cast part which holds the main spindle on which the Disc number counters and the indexing cover and driven pinions are mounted.

Disc counter: Are generally die cast and the periphery of the disc is engraved in numbers. They are also made from plastic injection molding.

Pinions: Are generally die cast or plastic injection moulded parts.

Indexing Cam.: Made of brass sheet blanked out and screwed on the main driving counter disc. It is presumed that the die cast and plastic injected molded number discs are to be purchased from outside.

All the parts are assembled and tested for free running of the mechanism.

IV. Quality, Standards and Specification

The mechanism must freely work and register the counting of the number of revolution on a testing fixture and rotated at different speeds. In the absence of ISI specification any other international standards may be followed.

V. Land & Building (Rented):

Covered area 200 sq. metres. 500 00

VI. Machinery & Equipment :

- | | | |
|--|--------|-----------|
| 1. High precision centre lathe with collet and chucking. ht. of centre 4 1/2". length of bed 3 ft. "Geedee Wieler" or similar. | One | 32,000.00 |
| 2. Capstan lathe, bench type ht. of centre 2 1/2" length of bed 18" (PMT Jude) or (Deem). | One | 24,000.00 |
| 3. High precision and high speed Bench drilling and tapping machine 6 mm dia cap. 'Re nit or Thakur'. | Two | 16,000.00 |
| 4. Double ended bench grinder 8" wheel dia. | One | 1,500.00 |
| 5. Hand Press No. 5. | 2 Nos. | 3,000.00 |

6. Hand operated milling m/c. Table size 24" KALSI or CEMOTEC or similar. One	28,000·00
7. Dies, jigs & fixtures.	5,000·00
8. Measuring instruments, hand tools, and minor equipment & test bench.	7,000·00
9. Installation & erection.	10,000·00
10. Office equipment, Workshop tables, Assembly tables, racks, stools etc.	7,000·00
	<u>1,23,500·00</u>

VII. (i) Raw material & bought out components/month

1. Brass sheets: 12 SWG & 16SWG 50 Kgs @ 28/- Kg.	1,400·00
2. Aluminium sheets 850 Kg @ Rs. 18/- Kg.	900·00
3. P.C.R.C. Sheets 20 swg 50 Kgs @ Rs. 9/- Kg.	450·00
4. Aluminium Die casting frame or bottom plate.	1,000·00
5. Free cutting steel rods—8 mm & 6 mm dia.	100·00
6. Silver steel rods—1·8 mm to 2 mm dia.	200·00
Total of (i)	<u>4,050·00</u>

(ii) Components/parts to be purchased for 650 counters/month

1. Plastic disc. counters and die cast aluminium disc. counters and pinions.	5,000·00
2. Pins, nuts, washers & screws.	100·00
3. Painting charges.	200·00
Total of (ii)	<u>5,300·00</u>

(iii) Indirect materials

Lubricants, cutting oils, waste cotton, cutting tools, etc.	2,200·00
Total (i)+(ii)+(iii)	<u>11,550·00</u>

VIII. Staff & labour/month

A. Administrative & Supervisory

1. Manager-cum-Engineer. One	850·00
2. Foreman. One	600·00
3. Inspector. One	500·00
4. Ministerial staff. Two	900·00
5. Peon. One	200·00
6. Chowkidar. One	200·00
	<u>3,250·00</u>

B. Technical & others

1. Machine operator. 5	2,000·00
2. Assembly Fitters. 1	400·00
3. Helper. 1	200·00
4. Packer. 1	200·00
	<u>2,800·00</u>
Staff welfare @ 30%.	1,815·00
Total A+B	<u>7,865·00</u>

IX. Other expenses

1. Electricity & Water.	300·00
2. Maintenance & repair.	100·00
3. Printing, postage & stationery.	200·00
4. Consumable stores.	250·00
5. Advertisement.	250·00
6. Packing expenses.	250·00
7. Taxes.	100·00
8. Other misc.	100·00
9. Rent.	500·00
	<u>2,050·00</u>

X. Working capital month

1. Raw material.	11,550·00
2. Personnel.	7,869·00
3. Other expenses.	2,050·00
	<u>21,465·00</u>

XI. Capital investments

1. Machinery & Equipment.	1,23,500·00
2. Working capital for 3 month.	64,395·00
	<u>1,87,895·00</u>

XII. Cost of production/month

1. Recurring expenses.	21,465·00
2. Insurance.	100·00
3. Depreciation on machinery & equipment @ 10% (say).	1,030·00
4. Interest on capital investment @ 15%.	2,340·00
	<u>24,935·00</u>

XIII. Sales proceeds :

By selling of 650 revolution counters of different sizes @ Rs. 45/- per piece.	31,250·00
--	-----------

XIV. Profitability/month

Profit=Sales—Cost of production 31,250—24,935 = Rs. 6,315	
Percentage of profit on sales= $\frac{6315 \times 100}{31,250}$ = 20·2%	
Percentage of profit on investment = $\frac{6315 \times 12 \times 100}{1,87,895}$ = 46·3%	

XV. Break-even point

Fixed Cost

Rent	500.00
Interest	2,340.00
Insurance	100.00
Depreciation	1,030.00
40% salaries (say)	3,105.00
40% other expenses	820.00
	<u>7,895.00</u>

$$\frac{\text{Fixed cost} \times 100}{\text{Fixed cost} \times \text{profit}} = \frac{7895 \times 100}{14210} = 55.5\%$$

XVI. List of machinery suppliers

1. M/s. Perfect Machine Tools (P) Ltd., Bell Buildings, Sir P.M. Road, Bombay-1.
2. M/s. Butliboi & Co., Jeevan Vihar, Parliament Street, New Delhi-1.

Rs.

3. M/s. Kalsi Engineering Works, Miller Ganj, Ludhiana.

M/s. Voltas Limited,
Kasturba Row,
Bangalore.

XVII. Suppliers of raw materials

1. M/s. Kamani Metals & Alloys, Bombay.

2. M/s. K's Engineers (P) Ltd., Kanakapane Row, Bangalore.

(For disc.
wheels of
aluminium

3. M/s. International Instruments, Pvt. Ltd, Hosu Row, Bangalore.

(For plastic
Dic cast
disc wheels).

4. M/s. Maroli Meters (P) Ltd., Industrial Estate, Rajaji Nagar, Bangalore-44.

(For plastic
disc
wheels)

(Reserved item Sl. No. 790)

I. Product and its uses

(a) Desert Type Room Coolers are used in summer for cooling rooms in homes, offices, hotels and restaurants. These are used during the months from April to October.

(b) Market Potential

The demand for this item depends on opening of new offices and replacement demand from office already using such coolers, construction of residential accommodation, rise in standard of living of the people in general and the extent of heat during summer season in a particular year. The coolers are given on rental basis for the season and are also sold to the users.

For quite some time the demand for such coolers has been rising in the past. Market enquiries have revealed that this trend is likely to continue in the coming years and the demand for such coolers is expected to rise at the rate of about 10 to 15 per cent per annum, both for outright sale as well as on rental basis. Some of the users get the coolers assembled at site after getting spare parts purchased from the market.

II. Production Target (Per Annum)

The following is the per annum production capacity on single shift basis:

S. No.	Item	Fan Size	Qty.	Value (Rs.)
1.	Desert Coolers	16"	900	10,80,000.00
2.	Desert Coolers	13"	900	11,70,000.00

III. Production details and process of manufacture

(A) Process Outlines

The sheets are sheared to required size. The fins on sheets are made on power press. Finally, these sheets are assembled in 'Box-Form'. The frame for supporting the fan motor is made from angle Iron and fitted to fan motor with bolts and nuts. All the parts including fan motor pump, sheet-box, switches, pipes etc. are assembled manually and given the shape of room cooler.—These coolers are baked in oven and then tested according to IS Specifications.

(B) Basis and presumptions.

The basis for the calculation of the production capacity is calculated on single shift basis on 75 per cent efficiency.

The rate of interest in the scheme has been taken on the basis of 15 per cent at an average. However, this figure is likely to vary depending on the financial outlay of the project as well as location of the unit.

The break even point in the scheme has been calculated on the full capacity utilisation basis.

The cost of machinery and equipment items as indicated refers to a particular make and the prices are approximately those ruling at the time of the preparation of this report.

The provisions made in other respects viz. raw materials, personnel, utilities, overheads etc. are drawn on the basis of standard operations and average outputs and the costs indicated against each are approximate and based on local markets, conditions and observations.

It is assumed that there are no pre-operative expenses.

The pump, motor, switches, PVC cable and cup, wood wool, pad, bolts anodised plates are bought out components.

IV. Quality and specifications

This scheme is based on IS 3315—1974. The cooling efficiency is based on following formula—

$$\text{Cooling efficiency} = \frac{\text{Tdb} - \text{Tdb}}{\text{Tdb} - \text{Twb}} \times 100$$

When Tdb = Dry bulb temperature of Inlet air.

Tdb bulb temperature of Outlet air.

Twb Wet bulb temperature of Inlet air.

Filter pads shall be made of fibres capable of holding moisture but having resistance to fungal growth. The scheme is based on 2 sizes of fan i.e. 16" and 18".

V. Land & Building

(Rupees)

Covered area 200 sq. metres @
Rs. 10/- per sq. mtr. (Rented) 2,000.00

VI. Machinery & Equipment

Sl. No.	Description	Indigenous/ Imported	Qty.	Price (Rs.)
(1)	(2)	(3)	(4)	(5)
1.	Guillotine shearing M/c. 4' (Pedestal operated)	Indigenous	1	4,000.00
2.	Power Press 50 MT 5 HP.	-do-	1	20,000.00
3.	Air Compressor 1 HP with spray gun	-do-	1	3,000.00
4.	Gas welding set (Small)	-do-	1	2,500.00
5.	Baking ovens 6'x5'x5' cap. electrically heated	-do-	1	12,000.00
6.	Portable Drilling M/c. 1/4" (2 nos.)	-do-	1	2,000.00

VII. Raw Material (Per Month)

S. No.	Particulars	Indigenous/ Imported	Qty	Rate	Value (Rs.)
1.	M.S. Black sheet 18 SWG.	Indigenous	6.5 MT	3900 per ton	25,350.00
2.	Motorised Pump	-do-	150 nos.	150 each	22,500.00
3.	Motor with fan	-do-	150 nos.	600 each	90,000.00
4.	Switches & cables	-do-	—	—	900.00
5.	Angle Iron 1 1/2' x 1 1/2' x 1/2'	-do-	1.5 M. ton.	3000 per Ton.	4,500.00
6.	Bolts, screws and rivets	-do-	—	—	450.00
7.	PVC pipe & cup	-do-	—	—	600.00
8.	Wood wool pads	-do-	150 nos.	Rs. 10/-per set	1,500.00
9.	Anodised Aluminium Sheet	-do-	150	@Rs.3/- per set	450.00
10.	Paints & Chemicals	-do-	—	—	3,000.00
					1,49,250.00

VIII. Staff & Labour (Per Month)

(i) Personnel

1.	Manager	1	1000.00
2.	Supervisor	1	800.00
3.	Clerk	1	300.00
4.	Chowkidar	1	200.00

(ii) Technical, Skilled & Unskilled

1.	Skilled workers	2	900.00
2.	Unskilled workers	7	1,400.00

Total (salaries) 4,600.00

(+) Perquisites @ 15% of salaries. 690.00

5,290.00

IX. Other Expenses

1.	Power (20 HP)	630.00
2.	Water	120.00
3.	Rent	2,000.00
4.	Postage and stationery	100.00
5.	Taxes	100.00
6.	Telephone	200.00
7.	Consumable stores	100.00
8.	Repair and maintenance	200.00
9.	Insurance.	100.00
10.	Transport charges	500.00
11.	Sales Expenses	600.00
12.	Advertisement	200.00
13.	Miscellaneous	200.00

5,050.00

X. Total Working Capital (Per Month)

	(Rupees)
1. Raw material	1,49,250.00
2. Staff & salary	5,300.00
3. Other expenses	5,050.00
	<u>1,59,600.00</u>

XI. Total Capital Investment

1. Fixed capital	67,510.00
2. Working capital for 3 months	4,78,500.00
	<u>5,46,010.00</u>

XII. Cost of production (Per Year)

1. Depreciation on machinery @ 10%	5,410.00
2. Depreciation on dies @ 25%	500.00
3. Depreciation on oven @ 20%	2,400.00
4. Depreciation on office and workshop furniture	1,000.00
5. Working Capital	19,14,000.00
6. Interest on investment @ 15%	81,900.00
	<u>20,05,210.00</u>
Say	<u>20,05,200.00</u>

XIII. Sales Proceeds (Per Year)

1. By sale of 16" size room cooler @ Rs. 1200/- 900 nos.	10,80,000.00
2. By sale of 18" size of room cooler @ 1300 900 nos.	11,70,000.00
	<u>22,50,000.00</u>

XIV. Profitability

Net profit per year	22,50,000.00
(before income tax)	20,05,000.00
	<u>2,44,800.00</u>
Percentage of profit on sale = $\frac{2,44,800 \times 100}{2250,000}$	= 10.8%
Percentage of profit on investment = $\frac{2,44,800 \times 100 \times 12}{5,46,010}$	= 53.8%

XV. Break Even Analysis

$$B. E. P. = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Sales} - \text{Annual Variable Cost}} \times 37\%$$

XVI. Names and Addresses of Machinery & Equipment Suppliers.

1. M/s. Narang Scientific Works, Naraina Industrial Area, Phase I, NEW DELHI.	Baking Ovens
2. M/s. Mankoo Industries, 587, Industrial Area B Ludhiana 1-3.	Power Press
3. Pathick Engineering Works, A-41, Maya Puri Industrial Area Phase I, NEW DELHI.	Tanks
4. M/s. Kirloskar Brothers, Poona.	Air Compressors
5. M/s. Indian Oxygen, Najafgarh Road, New Delhi.	Gas Welding set
6. M/s. Parmar & Sons, 95, Parmar House 5th Kumbharwada Bombay-4.	Guillotine Shearing M/c.
7. M/s. Delhi Mechanical Works, B-29, Wazirpur Industrial Area, New Delhi.	-do-
8. M/s. Maya Engg. Works, 200-A, S.P. Mukherjee Road, CALCUTTA.	Drill

XVII. Raw material

Raw material is available locally.
 (Reserved item Sl. No. 516).

I. Product and Its Uses

Rolling shutters are made of steel sheet strip and the shutters can be rolled over a winding mandril. As the rolling shutters are wound over on a overhead winding mandril the shutter will not give any problem for movement of people etc. The shutters roll upwards parallel to front wall not occupying any space in the floor and therefore, they are preferred for use in shops. Further as these are made of steel sheets. They are strong long lasting and safe. It is not necessary to describe the rolling shutter as even the common man has seen them.

II. Market Potential

Due to the above reason, there is demand for rolling shutters. As the establishments are increasing in number every year, the demand for rolling shutters is increasing. They are sold directly to consumers.

III. Production Target

It is proposed to manufacture 500 sq. meters of rolling shutter per month in different sizes.

IV. Production Details and Process of Manufacture:

M.S. strips of desired width are taken in coil form and fed to roller type. Sheet forming machine in which the rolling shutter profiles are formed.

The spring steel wires are formed into springs in the hand operated spring coiling machine. The channels are made in the hand press brake. The hand shearing machine is used for cutting the plates required for frame fabrication. All the components are assembled and painted with red oxide primer.

V. Inspection and Quality Control

The tension of the spring should be sufficient to lift the shutters rapidly. The bead joints on the profile strips should be perfect.

VI. Land & Building :

Rs.

Covered Area 200 sq. meters. (rented) 1,000.00

VII. Machinery & Equipment

1. Hand Shearing machine 300 mm (12") length of blade, capacity to cut 6 mm plates 1 No. 500.00

2. Roller type sheet profile forming machine for forming profiles out of coils continuously out of 150 mm width X 18 SWG, M.S. Strips	1 No.	25,000.00
3. Hand Press brake 2.5 metres X 16 G (8ft.)	1 No.	10,000.00
4. Spring coiling machine hand operated	1 No.	2,000.00
5. Hand operated screw press No. 10 Double pillar type	1 No.	3,000.00
6. Welding transformer 300 AMP	1 No.	4,500.00
7. Pillor drilling machine 3/4" dia cap	1 No.	4,000.00
8. Bench grinder D.E. 10" dia. wheel	1 No.	1,500.00
9. Tools, dies etc.		5,500.00
10. Office furniture & equipment		6,000.00
11. Installation and electrification		8,000.00
Total		70,000.00

VIII. Raw Materials (Per Month)

1. M.S. Strips 18G to 22G 5.5 Tons	22,000.00
2. Spring wires 3 mm to 6 mm dia. 0.75 Tons	4,500.00
3. M. S. Sheet & Flats different gauges 1.5 ton	6,750.00
4. Purchased components like bolts, nuts, rivets etc.,	5,000.00
TOTAL	38,250.00

IX. Staff Labour (Per Month)

1. Skilled worker	1 No.	400.00
2. Semi-skilled worker.	2 No.	500.00
3. Unskilled workers	2 Nos.	400.00
4. Office staff	2 Nos.	1,000.00
5. Welfare facilities for staff & labour		550.00
Total		2,850.00

X. Other Expenses (Per Month)	Rs.
1. Rent	1,000.00
2. Electricity & Water	200.00
3. Consumable tools	100.00
4. Oils, lubricants and other consumable stores	500.00
5. Cartage and freight	200.00
6. Maintenance	200.00
7. Replacement of dies	200.00
8. Packing cost	200.00
9. Publicity expenses	200.00
10. Sales expenses	200.00
11. Stationery, Postage & misc. expenses	200.00
TOTAL	3,200.00

XI. Working Capital (Per Month)	Rs.
1. Raw materials	38,250.00
2. Staff & Labour	2,850.00
3. Other expenses	3,200.00
Total	44,300.00

XII. Total Capital Investment	
1. Machinery & equipment	70,000.00
2. Working capital for 3 months	1,32,900.00
Total	2,02,900.00
Say	2,03,000.00

XIII. Manufacturing cost (Per Month)	
1. Raw Materials	38,250.00
2. Staff & labour	2,850.00
3. Other expenses	3,200.00
4. Depreciation on machine & equipment at 10% per annum	584.00
5. Interest on capital investment at 15% per annum	2,538.00
Total	47,422.00
Say	47,450.00

XIV. Total Sales (Per Month)	
By sale of 500 sq. metres of rolling shutters at Rs. 105 per sq. metre	52,500.00

XV. Total Profit (Per Month)	
Profit per month = Total sales - Manufacturing cost	
	= 52500 - 47450
	= Rs. 5050.00
Profit per annum = Profit per month × 12	
	= 5050.12
	= Rs. 60600.00

(a) Profit percentage on sales	
Profit per month	
= $\frac{\text{Profit per month}}{\text{Sales per month}} \times 100$	
	$\frac{5050}{52500} \times 100$
	9.63%

(b) Profit percentage on capital investment	
Profit per annum	
= $\frac{\text{Profit per annum}}{\text{Capital investment}} \times 100$	
	$\frac{60600}{203000} \times 100$
	29.85%

XVI. Break Even Analysis

Break even point	= $\frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}}$
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Fixed Cost per month

1. Rent	1,000.00
2. 40% of staff & Labour	1,140.00
3. 40% of other expenses excluding rent	880.00
4. Depreciation machinery	584.00
5. Interest on capital investment	2,538.00
Total	6,142.00

Annual fixed cost	= 6142 × 12 = Rs. 73,704.00
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Break even percentage = $\frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual Profit}} \times 100$	
	$\frac{73704}{73704 + 60600} \times 100$
	$\frac{73704}{134304} \times 100$
	= 54.82%

XVII. Name and Address of Suppliers of Machinery & Equipments

1. M/s. Machine Tools Traders.,
25, Ganesh Chandra Avenue,
CALCUTTA-700013.
2. M/s. J.K. Engineering Works,
308/A/13C, Shahzadabag,
Old Rohtak Road,
Delhi-110007.
3. M/s. Prabhat Engineering Works,
119/120, Masimabad,
KANPUR

XVIII. Name and Addresses of Suppliers of Raw Materials.

1. Nearest local branch of Steel Authority of India Ltd.
2. M/S. Mehta Mannal chenmalji & Co.,
87-88, Kika Street,
BOMBAY-400004.
3. M/s. Agrawal Traders & Engineers,
129, Abdul Rehman Street,
BOMBAY-400003.

(Reserved item Sl. No. 394)

Product and its uses

The aluminium sanitary fixtures are used in both bathrooms and toilets as they are rust proof and cheapest in price. The items being made in aluminium are towel stand, grates, towel pegs, trays for soap and brushes, and looking glasses. The sanitary fittings are normally made out of aluminium extruded sections.

Market Potential

The maintenance cost of these fixtures is negligible and the price is cheap than the brass/bronze electroplated sanitary fixtures. The demand of sanitary fittings is increasing due to heavy construction of residential buildings. The indigenous and the export demand is increasing for such type of items.

Production Target

It is proposed to manufacture 3.3 M.T. of finished sanitary fixtures per annum on single shift basis.

Product detail and process of manufacture

The pieces are cut to size and are bent, rivetted, welded in required size and shape and are finished and anodized if necessary.

Financial Aspects**1a Fixed Capital**

	Rs.
(A) Land & Building covered area 100 sq. M. @ Rs. 10/-sq. M. on rent.	1,000.00
(B) Machinery & equipment production unit.	
(a) Power hacksaw 1/2 HP 3 phase 440 volt	800.00
(b) Power press 10 ton capacity with 2 HP Motor	10,000.00
(c) Bench type drilling machine 1/2" cap	1,500.00
(d) Universal bending machine hand operated	1,200.00
(e) Gas welding set	3,500.00
(f) Guillotine shearing machine 2 ft. length foot-operated	2,500.00
(g) Motorised double ended Grin- der 1/2 H.P. motor	1,000.00
(h) Portable hand drill 1/4" cap.	800.00
	<u>21,300.00</u>

Installation & electrification @ 10%	Rs. 2,130.00
Total	<u>23,430.00</u>
Cost of dies, jigs, fixtures, hand tool and measuring tools	5,000.00
Office furniture.	3,000.00
Total Fixed Capital	<u>31,430.00</u>
Say	<u>31,500.00</u>

Working Capital P/M

<i>Personnel Administrative</i>		
1. Manager	1	800.00
2. Accountant	1	500.00
3. Clerk/typist	1	400.00
4. Peon	1	200.00
5. Chowkidar.	1	200.00
<i>Technical</i>		
6. Skilled workers	3	1,200.00
7. Semi-skilled	4	1,200.00
8. Unskilled	3	600.00
		<u>5,100.00</u>
Perquisites @ 15%		<u>765.00</u>
		<u>5,865.00</u>

Raw Material P/M

Aluminium sheets, rod, pipes & extru- ded Section @ 26000/-M.T. 3.3 M.T.	85,800.00
Cost of rivets, screw etc.	1,200.00
	<u>87,000.00</u>

Utility

Power 3 K.W. units 450 units P.M. @: 30	135.00
Water 100 Kilo litres @ 50/KL	50.00
	<u>185.00</u>

Other contingent expenses P/M

1. Rent	1,000.00
2. Postage	50.00
3. Stationery	100.00
4. Telephone	100.00
5. Consumable stores	100.00
6. Repair & maintenance of dies, jigs & fixtures	200.00
7. Transport	100.00
8. Advertisement	100.00
9. Insurance	100.00
10. Taxes	50.00
11. Sales exp.	100.00
	<u>2,000.00</u>

	Rs.
Total recurring expenditure P.M. .	95,050· 00
Total working capital on 3 month basis	2,85,200· 00
Total capital investment—	
Fixed capital!	31,500· 00
Working capital	2,85,200· 00
	<u>3,16,700· 00</u>
Cost of Production	
Recurring exp.	95,050· 00
Depreciation on machinery	178· 00
Dep. on mould & fixture	135· 00
Int. on total investment	39,60· 00
	<u>99,323· 00</u>
Turn over P/M	
Finished Al. sanitary fitting app. 3 tons @ 34000/M.T.	1,02,00· 000
By sale of scrap 330 K.g @ 15/- K.G.	4,500· 00
	<u>1,06,500· 00</u>
Gross profit P/M	6,677· 00
Annual profit.	80,124· 00
Net Profit ratio	6· 6%
Rate of return	25· 2%
B.E.P.	54· 5%

Names and Addresses of Machinery Manufacturers/Suppliers

1. M/s. Machinery Impex Corporation, 271 -A Nagdevi Street, Bombay-3.
2. M/s. Continental Machine Tools, 25, Bank Stre et, Bombay-1.
3. M/s. Hemco Industries, 303, Bazar Gate Street, Bom- bay-1.
4. M/s. Hadavkar Mech. Works (P) Ltd., Akurli Road, Kandivli (East), Bombay-67.

Raw Materials (Aluminium)

1. M/s. Aluminium Extrusions, 115, Tambakanta, Babu Panalal High School, Ground Floor, Bombay-3.
2. M/s. Jeewanlal Ltd., Liberty Bldg., Marine Lines, Bombay-20.
3. M/s. Geeta Metal Industries, Mehta Bhavan, Shop 1, 311-Charni Road, Bombay-4.
4. M/s. Allied Aluminium 46, Bhuleshwar Road, 2 Bom- bay-2.
5. M/s. Metal Corporation, 7/11 Kolsa Street, Chunawala Building, Bombay-3.

(Reserved items Sl. No. 376).

I. (a) Product and its uses

Screw drivers are extensively used for screwing and un-screwing screws. These are also used in engineering work for driving machine screws of the slotted head type and for holding slotted head bolts to prevent them from turning round whilst their nuts are being screwed up.

(b) Market Potential

Screw Drivers are available in the market both of standard and non-standard quality. There are very poor number of units existing in the small scale sector in the country making the quality product. The unit making product marked ISI has no problem in sale. The screw drivers are generally sold to the customers through agents. Besides it has bright scope in the Middle East countries.

II. Production Target (per annum)

This scheme envisages the manufacture of Screw Drivers against the production capacity per month on single shift basis as per details given below:—

S. No.	Product	Production	Capacity per month
1.	Screw Driver 100 mm to 450 mm	2000 sets	(1 set consists of 8 nos. of assorted sizes).

III. Product details and process of Manufacture

The scheme envisages the manufacture of Screw Driver ranging from 100mm to 450mm sizes.

Process of Manufacture

Steel rods are cut to the required length and ground on the centreless grinder. The end of rod is forged and trimmed to form a tip shape. Other end is drilled to the required dia. The tips are roughly ground on double ended grinder. The tips are hardened and tempered in furnace and finished ground and sent for electroplating. Finally these rods are assembled with handles by fevicol and rivetted and then packed.

IV. Inspection and Quality Control

The screw drivers are made according to IS: 844-1962. The raw material used is Alloy Steel END & (EN—17). The hardness of the Screw Driver should

be 50-55 RC. The diameter and the length should be checked with micrometer and scale respectively.

V. Financial Aspects**1. Fixed Capital****(i) Land and Building** Rented

Total covered area

200 sq. metres @ Rs. 10 per sq. metre Rs. 2,000.00 (PM)

(ii) Machinery and Equipment**(a) Production Unit**

S. No.	Description	Indigenous/ Imported	Qty.	Value (Rs.)
1.	Centreless grinding m/c 25mm cap	Indigenous	1	35,000.00
2.	Friction screw press 60 mm dia screw	"	1	25,000.00
3.	Power press 10 ton cap.	"	1	10,000.00
4.	Oil fired furnace 1000° C horizontal chamber type 450 mm dia complete with burners and pyro- meters	"	1	15,000.00
5.	Oil fired salt bath heat treatment furnace 300 mm dia 600 mm deep complete with pyrome- ter	"	1	22,000.00
6.	Quenching tanks 3' x 2' x 2'	"	2	3,000.00
7.	Drilling m/c 12mm cap.	"	2	5,000.00
8.	Double ended grinder 300mm dia.	"	2	6,000.00
9.	Rockwell hardness tester	"	1	6,000.00
10.	Centre lathe 4½' bed	"	1	10,000.00
				1,37,000.00

**(b) Installation & elec-
trification charges@
10%**

13,700.00

**(c) Office Equipment &
Furniture**

5,000.00

**(d) Dies & Tools and
measuring instruments**

10,000.00

1,65,700.00

2. Working Capital

(Per month)

(i) Personnel

Designation (1)	No. (2)	Salary (3)	Total (Rs.) (4)
(Administrative & Supervisory)			
1. Manager	1	1,000.00	1,000.00
2. Accountant	1	500.00	500.00
3. Watchman Technical-skilled & Un- skilled	1	200.00	200.00

(1)	(2)	(3)	(4)
4. Supervisor.	1	700·00	700·00
5. Skilled workers.	6	300·00	1,800·00
6. Unskilled workers.	4	250·00	1,000·00
7. Helper.	4	200·00	800·00
Total (Salaries)			6,000·00

(+) Perquisites @ 15% of salaries. 900·00

6,900·00

(ii) Raw materials including Packaging Requirement (Per month) :

Particulars	Indigenous	Qty.	Rate	Value (Rs.)
	Imported			
1. Round Steel bars (EN9) 3 mm to 13 mm.	Indigenous	1·5 M. Ton	3500 per M. ton	5,250·00
2. Bought out components PVC handles, Riveting pins, Fevicol, Electroplating charges.				10,000·00
				15,250·00

(iii) Utilities (Per Month)

Power 15 H.P.	600·00
Furnace oil 2000 litre @Rs. 1·10 per litre	2,200·00
Water.	200·00
	3,000·00

(iv) Other contingent expenses (Per month)

1. Rent	2000·00
2. Postage & Stationery.	200·00
3. Taxes.	100·00
4. Telephone.	200·00
5. Consumable Stores.	200·00
6. Insurance.	100·00
7. Sales Expenses.	300·00
8. Advertisement.	500·00
9. Packaging charges.	1,000·00
10. Miscellaneous.	200·00
11. Transport charges.	200·00
12. Repairs and maintenance.	400·00
Total	5,400·00

(v) Total Working Capital :

	Rs.
Personnel.	6,900·00
Raw materials.	15,250·00
Utilities.	3,000·00
Other contingent expenses.	5,400·00
	30,550·00

(vi) Total Working Capital (on 3 months basis).

91,650·00

3. Total Capital Investment.

(i) Fixed capital.	1,65,700·00
(ii) Working Capital for 3 months.	91,650·00
	2,57,350·00

4. Cost of Production (per year) :

1. Depreciation on machinery @10%	9,700·00
2. Depreciation on furnaces @30%	12,000·00
3. Depreciation on Dies, Tools @25%	4,000·00
4. Depreciation on Furniture @20%	1,000·00
5. Interest on Investment @ 15%	38,600·00
6. Working Capital.	3,66,600·00
	4,31,900·00

5. Turn over (per year) :

Item	Qty.	Rate	Value (Rs.)
Screw Drivers	24000 sets (8 in one set)	@Rs. 23·50	5,64,000·00
Net Profit per year (5—4)			1,32,100·00
7. Net Profit ratio.			24%
8. Rate of return.			51%
9. Break even point.			50%

VI. Address of Machinery Suppliers :

1. M/s. Hindustan Machine Tools, 132, Mount Road, Madras-6.
2. M/s. National Small Industries Corpn., Okhla, New Delhi-20.
3. M/s. Perfect Machine Tools Co. Ltd., 123, Mount Road, Madras-6.
4. M/s. Alfred Herbert India (P) Ltd., Dare House, Madras-1.
5. M/s. William Jacks & Co. (P) Ltd., 378, N.S.C. Bose Road, Madras-1.
6. M/s. Jayems Engg. Co., 317, Thambur Chetty Street, Madras-1.

Heat treatment & Furnaces

1. M/s. Bagsvig Heat Treatment Equipment, 150-A/2, Mount Road, Madras-1.
2. M/s. Wesman Engg. Co., 150-B, Mount Road, Madras-1.
3. M/s. Indian Furnace Co. (P) Ltd., 12-A, Dr. Annie Basant Road, Worli, Bombay-18.
4. M/s. Therlee Furnaces, Tripunithura, Ernakulam, Kerala.
5. M/s. Mallk Electric Works, 106, Mount Road, Madras-18.

Raw Materials

1. M/s. Rathi & Sons, 82, Nagdevi Cross Lane, Bombay-3.
2. M/s. Teedee Steel Corpn., 84, Memon Wada, Bombay-3.
3. M/s. Hindustan Metal & Engg. Co., 8/10, 2nd Carpenter Street, Bombay-4.
4. M/s. Mool Chand Mammal & Co., 68, Kika Street, Bombay-4.

Hardness Testing Machine

1. M/s. Blue Star Ltd., 23/24, 2nd Lane Beach, Madras-1.
2. M/s. Fuel Injection Equipment, Ichal Karanji, Maharashtra.
3. M/s. Testing Machinery Corpn. 51/53 Nagdevi Cross Road Lane, Bombay-2.

(Reserved item Sl. No. 412).

I. Product and its Uses

Every commercial vehicle require seats for Drivers and passengers. These are fitted after the chassis Frames are delivered by Automobile Manufacturers. Transport Corporations and other customers are purchasing Seat Frames as per their own requirements. For buses various sizes of seats are required ranging from single seats to six seaters.

II. Market Potential

About 40,000 commercial vehicles are produced in India every year and a number of these are purchased by the State Transport Corporations of various States. The activities of most of these Corporations are expanding fast as various rural areas are now being connected with principal cities through State transport buses. In view of this, demand for seat Frames are increasing regularly and will be increasing still faster in future.

III. Production Target

The production profile has been estimated on monthly production of 50 Drivers seats, 300 two seaters, 250 three seaters and 50 six seaters.

IV. Production Details and Process of Manufacture

Seat Frames are basically tubular structures reinforced in places with steel strips which are also required for fixing Cushion assemblies. Constructions are made by bending the tubes and tack welding the joints. The welded areas are to be polished and cleaned prior to delivery. For rust prevention customer's advice will have to be observed and necessary operations will have to be carried out accordingly.

V. Quality Control and Standards

Products are to be manufactured according to customers' specifications. Templates should be provided for checking at the state of bending to reduce time and additional expenses at the stage of welding. No I.S.I. Specification is released for this item, so far.

VI. Land and Building

Covered area of 100 square metres to be rented @ Rs. 5/- per square metre per month	Rs. 500.00
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VII. Machinery and Equipment

	Rs.
1. Treadle Guillotine Shearing M/C-1200 mm Capa.	5,000.00
2. Hand operated hydraulic tube bending machine-1/2" to 2" Capa.—2 nos.	5,000.00
3. Arc Welding Transformer Amp. range 35 to 300	5,000.00
4. Hand operated Press Brake Capa. in M.S.—1/8"	11,000.00
5. 40 Ton Capa. Power Press Open back Inclinable	15,000.00
6. Air Compressor with 1 H.P. Motor	2,500.00
7. Portable Spraying machine	2,000.00
8. Pedestal Grinder 10" wheel size	1,500.00
9. Flexible Grinder	2,000.00
10. Gas Welding Set with spare Cylinder and accessories	1,500.00
11. Work Bench, Vise and hand tools	5,000.00
12. Furnitures and office equipments	4,000.00
13. Erection, electrification	4,500.00
	64,000.00

VIII. Salaries and Wages (Per Month)

	Rs.
1. Supervisor	800.00
2. Skilled worker—2 nos. @ 400 per month.	800.00
3. Semi-skilled workers—4 nos. @ 250 per month	1,000.00
4. Unskilled workers—2 nos. @ 200 per month	400.00
5. Clerk-cum-Storekeeper @ 400 per month	400.00
6. Watchman-cum-Peon—200 per month	200.00
7. Labour amenities	400.00
	4,000.00

IX. Raw Materials (Per Month)

	Rs.
1. M.S. Tubes 18 G & 20 G @ Rs. 5/- Per metre 3700 metres	18,500.00
2. M.S. Sheets etc. 2800 kg. @ Rs. 3200 per M.T.	8,960.00
3. Sundries	500.00
	27,960.00
Say	28,000.00

X. Other Expenses (Per Month)	Rs.
1. Rent	500.00
2. Power, electricity	250.00
3. Consumable stores	300.00
4. Maintenance and small tools	300.00
5. Packing and Transport.	500.00
6. Contingencies	150.00
	<u>2,000.00</u>

XI. Working Capital (3 Month's Recurring Expenses)	Rs.
1. Salaries and Wages	12,000.00
2. Raw Materials	84,000.00
3. Other expenses	6,000.00
	<u>1,02,000.00</u>

XII. Capital Investment	Rs
1. Fixed	64,000.00
2. Working	1,02,000.00
	<u>1,66,000.00</u>

XIII. Cost of Production (Annual)	Rs.
1. Salaries and wages	48,000.00
2. Raw Materials	3,36,000.00
3. Other expenses.	24,000.00
4. Depreciation of M/c @ 10% per annum	6,400.00
5. Interest on Capital Investment @ 15% per annum	24,900.00
	<u>4,39,300.00</u>

XIV. Sales Proceeds (Annual)	Rs.
1. 600 Driver's seat @ Rs. 35 each.	21,000.00
2. 3600 Two Seaters @ Rs. 55 each	1,98,000.00
3. 3000 Three Seaters @ Rs. 70 each	2,10,000.00
4. 600 Six Seaters @ Rs. 90 each	54,000.00
	<u>4,83,000.00</u>

XV. Profitability (Before Charging Taxes)

Profit = XIV—XIII = Rs. (483000—439300)
= Rs. 43700

The profit is 9% of sales and 26% of capital investment.

XVI. Break even Analysis

Fixed cost

	Rs.
1. Depreciation of machinery	6,400.00
2. Interest on Capital Investment	24,900.00
3. Rent	6,000.00
4. 40% of Salaries and wages	19,200.00
5. 40% of other expenses	7,200.00
	<u>63,700.00</u>

$$\begin{aligned}
 \text{Break even Point} &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\
 &= \frac{63700 \times 100}{63700 + 43700} \\
 &= \frac{6370000}{107400} \\
 &= 59.5\%
 \end{aligned}$$

XVII. Sources of Machinery

1. Machine Tools Traders (Cal.), 25 Ganesh Chandra Avenue, Calcutta-700013.
2. Ashok Metal Industries Tagore Road, Bhaktinagar, Rajkot-360002.
3. Satelite Commercial Co., 153 Janjibar Street, Bombay-400003.
4. Ashok Bros., 37 Panchkuin Road, New Delhi-110001.

(Reserved item Sl. No. 622).

I. The product and its uses

(a) Seed bins are used for the safe storage of seeds from damage from insects etc. These bins are normally available in round and rectangular shapes and are made from G.P. Sheets. In cities these bins are used as containers for grains, pulses and other similar materials when they are purchased in bulk by consumers.

(b) Market Potential

These days in our country new and hybrid varieties of grains, pulses, oil seeds etc. are developed in various research Institutions and Agriculture farms. The seeds of these varieties give better yield hence farmers have to purchase seeds. The seeds cannot be used immediately hence there is necessity to store these carefully to avoid damage. Thus there is regular demand from villages. In cities state and other corporations give advance to their employees to purchase wheat and other grains when the fresh crop comes into market. When these products are purchased in bulk for year's consumption they are stored in containers; as such in cities also there is regular demand for these containers.

II. Production Target

It is presumed to manufacture 600 numbers of 2 quintal capacity and 600 numbers of 5 quintal capacity seed bins per annum. However, the number and sizes is to be decided as per demand.

III. Production details and Process of manufacture:

G.P. Sheets are cut to size on shearing machine. Then these are bent to form and ends are folded. The bottom for round seed bins are cut on circle cutting machine. Two grooves are made on the body sheet to give strength to the body. The hook lock joints are formed for fixing bottom and sides. M.S. ring is fitted on the bottom to avoid rusting etc. Lids are fitted and two handles are also fitted for easy handling of seed bins. In case of rectangular seed bins angles are fitted on edges for strength.

IV. Quality Control and Standard

The quality of seed bins will depend upon the quality of G.P. Sheets used. It should be ensured that only tested materials are used having proper thickness of plating and gauge of sheet. These being

costly items, proper attention should be given for making bottom and side joints. The lid and handles should be handled properly.

V. Land and Building

	Rs.
Covered Area Sq. metre Rented	500.00

VI. Machinery and Equipment

1. Treadle operated guillotine shearing machine complete, fitted with blades and springs and standard accessories capacity 36" x 16SWG	1 No.	5,000.00
2. Hand operated slipout type bending roller for bending sheet into complete cylinders or curving them to suit the requirement Capacity 36" x 16SWG	1 No.	2,500.00
3. Hand lever shearing machine capacity 1/4" thick sheet	1 No.	800.00
4. Bench Drill 1/2" capacity	1 No.	1,500.00
5. Circle cutting machine capacity 36 diameter circle	1 No.	3,000.00
6. Arc welding set	1 No.	2,500.00
7. Tools etc.		3,000.00
8. Installation		1,300.00
9. Office furniture		2,000.00
		21,600.00

VII. Raw Material Requirements (Per Month)

	Rs.
1. G. P. Sheet 24 & 22 SWG 3.5 tons@ Rs. 6200	2,700.00
2. Angle Iron 25 x 2.5 x 3mm 175 Kgs.	450.00
3. M. S. Sheet 10 SWG 100 Kg.	350.00
4. Rivets	800.00
5. Welding Rod etc.	60.00
6. Misc. stores handle, Kunda etc.	200.00
	22,840.00

VIII. Staff And Labour (Per Month)

	Rs.
1. Manager	500.00
2. Clerk-cum-typist	300.00
3. Skilled workers	600.00
4. Unskilled workers	400.00
5. Watchman	200.00
6. Cost of labour benefits	300.00
	2,300.00

IX. Other Expenses (Per Month)

	Rs.
1. Rent	500·00
2. Electricity & water	50·00
3. Publicity expenses	100·00
4. Maintance & repairs	50·00
5. Stationery & postage etc.	50·00

X. Working Capital Required (Per Month)

1. Raw Materials	22,840·00
2. Staff and labour	2,300·00
3. Other expenses	850·00
	<u>22,990·00</u>
Say	<u>26,000·00</u>

XI. Total Capital Investment

	Rs.
1. Machinery & Equipment	21,600·00
2. Working Capital for three months	78,000·00
	<u>99,600·00</u>
Say	<u>1,00,000·00</u>

XII. Cost of Production (Per Annum)

	Rs.
1. Raw materials (22840 × 12)	2,74,080·00
2. Salaries (2300 × 12)	27,600·00
3. Other expenses (850 × 12)	10,200·00
4. Interest on capital @15%	15,000·00
5. Depreciation on machinery@10%	2,160·00
	<u>3,29,040·00</u>
Say	<u>3,29,000·00</u>

XIII. Total Sale (Per Annum)

	(Rs.)
By sale 600 seed bins of (1) 2 qtl. capacity @ Rs. 240	1,44,000·00
(2) By sale of 600 seed bins of 5 qtl. capacity @ Rs. 360	2,60,000·00
	<u>3,60,000·00</u>

XIV. Profitability (Per Annum)

Total sale—cost of production=Profit
Rs. 3,60,000—3,29,000=Rs 31,000

$$(a) \text{ Percentage of profit on sale} = \frac{31000}{360000} \times 100 = 8.6\%$$

$$(b) \text{ Percentage of return over investment} = \frac{31000}{100000} \times 100 = 31\%$$

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed cost} \times 100}{(\text{Fixed cost} + \text{Profit})}$$

Fixed cost (Per Annum)

	Rs.
1. Rent	6,000·00
2. Interest	15,000·00
3. Depreciation on M/c & equipment	2,160·00
4. 40% of salaries	11,040·00
5. 40% of other expenses	1,620·00
	<u>35,880·00</u>
Say	<u>36,000·00</u>

$$\text{B.E.P.} = \frac{36000 \times 100}{(36000 \times 31000)}$$

$$= 53.7\%$$

XVI. Name and Address of machinery Suppliers

1. M/s, Maneklal & Sons, 119 Narayan Dhan Street, Bombay.
2. M/s. Machine Tools Impex, 75 Ganesh Chandra Avenue, Calcutta-13
- M/s. Batliboi & Co. (P) Ltd., 26 R.N. Mukherjee Road, Calcutta.
4. M/s. Batliboi & Co. (Pvt.) Ltd., 98-A Armenian Street Madras.

(Reserved item Sl. No. 453)

I. Product Description and use

Since our country became independent, we have made rapid progress in almost all the fields. Agriculture is one of the occupations on which about 70 per cent of our population is dependent. Also it contributes the maximum to our economy. On this front also we have made tremendous progress under 'Green Evolution'. Our gross agricultural output has almost doubled in the past 15 years, and now we are one of grain surplus Nations of the world.

All this has been possible because of change-over from farming methods to modern mechanised farming, using different types of agricultural machinery, chemical fertilisers, insecticides, pesticides and use of electric and oil power for irrigation purposes.

The skill of local artisans and the finances by government agencies were fully exploited to design and develop simple machinery and equipment for use in the agricultural field. This thing created tremendous employment chances for the hereditary artisans and other unemployed persons, besides contributing a lot to the farmers. Simple machines like threshers, decorticators, winnowers, seed treaters, ploughs, seed Drills etc. are being made by such units. Still there is tremendous scope for producing these items in the other States of the country.

This profile has been formulated for the manufacture of simple agricultural machines like winnowers, seed treaters, etc. Almost any type of simple machines used for agriculture purposes can be made in this unit by slight change of materials.

The winnowers are used by the farmers for separating the straw out of grains after the harvested stock has been threshed. These are mostly used by the farmers who thresh the crops by help of animals or by chaff cutting machines in which the grain and straw remain mixed and those are to be separated with the help of natural wind or blower air. The winnowers blow the air for this purpose.

The seed treaters are used for treating the seeds against fungus and insects before storing in the bins or before sowing in the fields.

II. Market Potential

Looking to the simplicity of fabrication and vast farming population, there is a great potentiality for these machines. Also being cheap and simple to operate, there is no doubt about their being popular among the farmers, particularly in the eastern and western regions, where the big farm equipments have yet to be introduced to the general farming masses. In view of gradual awakening in using improved implements, scope of marketing will surely be improving day by day.

III. Target of Production

The annual turnover of approximate 40 tons of winnowers and seed treater has been planned under this Profile. In terms of numbers of machines, it may be roughly taken as:—

1. Winnowers upto 5 HP motive powers 100 nos.
2. Seed treaters of different sizes 100 nos.

IV. Production Details and Process of Manufacture:

These machines are proposed to be fabricated in a small unit having a set of 4 craftsmen and a few machines as per machinery details given further in this profile. The machines used for producing these items are lathe, drilling machine and welding set, which are general purpose machines and those may be used for any other purpose also when there is slump in the market due to seasonal sale of agricultural machinery. The major operations involved in the manufacture of these machines are:—

- Cutting the steel sections/sheets to sizes.
- Turning shafts, etc.
- Boring the bearing seats etc.
- Welding the parts together.
- Fitting the parts/sub-assemblies.
- Complete fitting of machine.
- Painting.

V. Quality Control and Standard

The products are mainly sheet metal fabricataions. For the purchased components, strict adherence to quality according to specifications are needed to be

observed. Finish and painting of the items are required to be attractive.

No special equipments are required for testing the finished products. The assembled machines are tested for performance. For this an electric motor fitted at the test platform is only the requirement.

VI. Land and Building

	Rs.
Total area of approx 1000 sq metres is required out of which about 250 sq metres should be covered	To be rented @Rs. 5/ per sq. meter of covered area 1,250·00

VII. Machinery · Equipment

	Rs.
1. Lathe machine 2,000 mm admit between centres and 300mm C. Ht. with accessories 1 No.	1,6000·00
2. Pillr dilling machine 40 mm cap. 1 No.	4,000·00
3. Electric welding set 300 AMP cap.—Transformer set 1 No.	8,000·00
4. Bench Grinder 250 mm wheel size 1 No.	2,000·00
5. Samll tools hand tools & measuring instruments	5,000·00
6. Installation Charges	3,000·00
7. Office furniture and equipment	3,000·00
Total	37,000·00

VIII. Raw materials (per month)

The raw materials required for these machines are M. S. Sheets Plates rounds, flats, angles employ oil barrels castings nuts and bolts. etc. Total weight of these items exluding the barrels is taken as approx 3·4 M. T. at the average rate of 3,200!—per M.T.

	Rs.
Empty oil barrels 200 litres cap. 4 nos.@ Rs. 70/- each	280·00
Bearings (slow speed)	1,500·00
Total	12,560·00

IX. Staff and Labour

	Rs.
1. Manager 1	700·00
2. Part-time Clerk cum accountsnt 1	300·00
3. Part-time sweeper 1	100·00
3. Skilled workers 2	800·00
5. Semi skilled workers 2	500·00
6. Watchman-cum-Peon 1	200·00
Total	2,600·00

X. Otaer expenses

	Rs.
1. Electricity & water (20 HP connected load)	450·00
2. Transport & Cartage	250·00
3. Maintenance & replacement of amall tools	300·00
4. Consumable Stores.	800·00
5. Stationery and postage	50·00
6. Miscellaneous expenses	200·00
7. Rent	1,250·00
Total	3,300·00

XI. Working Capital 6 for months)

(On this Project the working capital has been accounted for 5 months because the agriculture machines have got seasonal sale only related to major tow crops, i.e., Rabi and Kharif)

	Rs.
1. Raw materials	75,960·00
2. Salaries of staff & labour	15,600·00
3. Other expesnses	19,800·00
Total	1,11,360·00

XII. Total Capital Insvestment

	Rs.
1. Machinery & Equipmet	37,000·00
2. Working capital	1,11,360·00
Total	1,48,360·00

XIII. Cost of production (per annum)

	Rs.
1. Raw materials	1,51,920·00
2. Salaries & wages	31,200·00
3. Other expenses	39,600·00
4. Interest on capital @15% per annum	22,254·00
Total	2,44,974·00
5. Depreciation on machinery @10%	3,700·00
Total	2,48,674·00
Say	2,48,700·00

XIV. Sales Proceeds

	Rs.
1. By sale of 50 nos. of power operated seed Treaters without motors @Rs. 2,000·00 each	1,00,000·00
2. By sale of 50 nos. of hand operated seed Treaters @Rs. 800·00 each	40,000·00
3. By sale of 50 nos. of power operated winnowers without motors @Rs. 2,000·00 each	1,00,000·00
4. By sale of 50 nos. of hand operated winnowers @Rs. 800·00 each	40,000·00
5. By sale of scrap 35 tonnes @ Rs·1100 per M.T.	3,850·00
Total :	2,83,850·00

V. Profitability

Profit per annum in sales proceeds—

Cost to production

profit Rs. 2,83,850 Rs. 2,48,700/- Rs. 35,150/-

Percentage of profit on sales is nearly 12·5%

Percentage of return on capital is 23·3%

Break Even Analysis

A. Fixed Cost

	Rs.
1. Depreciation on M/c & Equipment .	3,700·00
2. Interest on total investment . .	22,254·00
3. 40% of salaries and wages . .	12,480·00
4. 40% of other expenses	15840·00
	54,274·00

B. Net Fixed cost

Rs. 54,300·00

$$\text{B.E.P.} = \frac{\text{Fixed cost} \times 100}{\text{Fixed/final cost} + \text{Profit.}} = \frac{5430000}{54300 + 35150} = 60\%$$

XVI. Machinery Suppliers

1. M/s Batliboi & Co. Forbes Stree Fort Bombay—400001.
2. M/s J. B. Advani & Co. Advani Chambers Sir P.M. Road Road Bombay-400001.
3. M/s Atlas Engineering Works G. T.. Road Batala
4. M/s Power Tools & Appliances. Co. 24-B.B.D Bagh Calcutta-700001.

(Reserved item Sl. No. 450)

I. Product and its uses

(a) Sheep shearing machine is electrically operated and is used for shearing the wool from the body of the sheep.

In the past, in our country, the wool was obtained from the sheep mainly by shearing the wool by hand clippers. In other countries like Australia and New Zealand mechanised sheep shearing is being done with the help of this machine.

(b) *Market Potential* Main concentration of sheeps in our country is in the States of Rajasthan, J. & K., Husbandry departments of State Government. Sheep of the States such as Rajasthan, J&K., etc. have started mechanised sheep shearing. The main buyers of sheep shearing machines are Sheep and Wool/Animal Husbandry department of State Government. Sheep Farms and wool shearers. Good quality sheep shearing machine is still being imported. Australian, Lister and Sunbeam makes are the popular sheep Shearing machines. There is good scope of this item in the country, but initially a lot of developmental work is required for manufacturing quality machine.

II. Basis and Assumptions

1. The production capacity is on single shift basis.
2. Pre-operative expenses and other contingencies includes cost of project preparation, margin for price rise in the plant and equipment and other expenses involved before starting production.
3. Rate of interest has been taken on the basis of 15 per cent on total investment which may be modified on the basis of actual conditions.
4. Break-even point has been calculated on full capacity utilisation.
5. Cost of machinery and equipment indicated in the scheme are approximately those prevailing at the time of report preparation.

III. Process Outline

This is a sophisticated item and needs accuracy. This scheme involves the manufacturers of mechined

components and assembly of machine. Castings and some of other parts such as electric motor, Ball bearings and small fittings, parts etc. are to be procured from the market. The equipment consists of following sub-assemblies.

- (i) *Machine:* Consists of a cast iron bracket. Electric Motor 1/2HP, Pulleys Spindle, Bearings etc. The function of the machine is to give high RPM.

Manufacturing consists, machining of C.I. Bracket, Spindle, Pulley and other cast irons/steel components as per design on different machines. All the components are inspected and the machine is assembled and tested.

- (ii) *Down Tube Assembly:* This is a long tube with short tubes, elbow joints, nylon core etc. The function is to transmit the movement from the machine to hand piece.

Manufacturing consists of cutting of tube to size machining of gears, joints, clamps, and components, making of sheet metal parts and nylon core etc, as per design and then assembling. Chrome plating of the tube will be done from outside.

- (iii) *Hand piece:* It is used for shearing the wool from the body of the sheep. This has cast Iron body and fitted with a number of components including comb and cutter.

Manufacturing consists machine of C.I. Body, manufacturing of combs, cutters and other components making of sheetmetal and wire components and assembly of hand pieces.

- (iv) *Specification:* No ISI specification is available for this item.

(v) *production capacity (per annum)*

(a) Quantity 300 Machines

(b) Value Rs. 12,00,000.00 (Approx)

(vi) *Motive power (Approx)* 25 H.P

I V. Financial Aspects (Fixed capital)

(i) Land and Building

Covered area of 3200 sq ft. including office, godown etc. on rent Rs. 1000/- per month

Note:— The rent may be much less in smaller towns. Suitable modifications may be made on the basis of prevailing rates of the selected location.

(ii) Machiner and Equipment Ind./Imported. Qty. Prices (Rs.)

1. Capstan Lathe 4-1/2 ft size with six position turret and all standared accessories complete with motor	Indigenous 1	60,000·00
2. Hicut Kirloskar lathe 6' size with accessories and complete with motor	Do. 1	35,000·00
3. Precision Drilling m/c 3" dia capacity with tapping attachment and motor	Do. 1	8,000·00
4. Tool & cutter grinder with attachements and motor	Do. 1	60,000·00
5. Universal Milling M/c Table size 36×8" complete with motor	Do. 1	30,000·00
6. Double ended Bench grinder with motor	Do. 1	3,000·00
7. Heat treatment electric - furnace with Tempera- ture control & quench- ing equipment etc.	Do. 1	20,000·00
8. Buffing machine	Do. 1	3,000·00
9. Tin smithy & hand Tools fitter benches etc.		3,000·00

(d) Measuring and testing Equipments

10 Jigs fixtures & tools, Dies and precision measuring instruments etc.		30,000·00
11. Hardness Tester	1	8,000·00

Erection & installation Charges—10% 26,000·00

2,86,000·00

Cost of office furniture and equipments 4,000·00

Pre-operative expenses and other contingencies etc. 10,000·00

Total fixed Capital 3,00,000·00

2. Working capital (per month)

(i) Personnel

(Admin. & Supervisory)	No.	Salary	Total Rs.
1. Manager/Engineer	1	1000	1,000·00
2. Accountant-cum-clerk	1	400	400·00
3. Sales/Services Engineer	1	700	700·00
4. Peon Chowkidar	2	200	400·00
			2,500·00

(Technical Staff

	NO.	Salary
1. Foreman	1	700
2. Supervisor	2	500
3. skilled workers	3	400
4. Semi skilled workers	4	300
5. Helpers	4	200
Total Salaries		7,400·00
+perquisites@15% of salaries		1,100·00
		8,500·00

(ii) Raw materials requirement (per month)

Particulars	Require- ment per machine	Total for 25 machines Rs.
1. Castings	200	5,000·000
2. Mild steel	50	1,250·00
3. High carbon steel & Alloy steels En. 8 etc.	150	3,750·00
4. Electric Motor	600	15,000·00
5. Ball Bearing	50	5,250·00
6. Seam'less tube	100	2,500·00
7. Spring washers Fasteners etc.	150	3,750·00
8. Leather Felt Nylons etc.	150	3,750·00
9. Mise. & others	50	1,250·00
		37,500·00

(iii) Utilities (per month) Rs.

Electricity & water 1,000·00

(iv) Other Expenses (per month)

1. Rent	1,000·00
3. Office Expenses	800·00
3. Advertisement	1,000·00
4. Travelling	1,500·00
5. Transportation	700·00
6. Packing	2,500·00
7. Repairs & Maintenance	1,500·00
8. Consumables	500·00
9. Misc. Expenses	1,000·00
	11,500·00

(v) Total recurring expenditure per month

8500+37500+11500=57,500/-

(iv) Total working capital for 3 months 1,72,500/-

3. Total investment

(1) Fixed Capital	3,00,000·00
(2) Working capital	1,72,500·00
Total	4,72,500·00

4. Cost of Production (per year)

	Rs.
1. Total recurring cost per year	6,90,000·00
2. Depreciation on Machine equipment etc@10%	28,600·00
3. Depreciation on office furniture @20%	800·00
4. Interest on total investment @15%	70,900·00
	7,90,300·00

5. Turnover (per year)

	Rs.
By sale of 300 sheep shearings machines @ Rs 4000/- each	12,00,000·00
Less commission on sales & other sales expenses @ 10%	(—) 1,20,000·00
Less cost of production	(—) 7,90,300·00
profit per year (Before Tax)	2,89,700·00

6. Rate of Return =60%

7. Break Even Point

i. Fixed Cost

	Rs.
(a) Depreciation on machines/equipments	28,600·00
(b) Depreciation on Furniture	800·00
(c) Rent of Building	12,000·00
(d) Interest on Investment	70,900·00
(e) 40% of Salary & wages	40,8000·00
(f) 40% of other Expenses	50,400·00
Total Fixed Cost	2,03,500·00

ii Net Profit per year 2,89,700·00

$$\text{B.E.P.} = \frac{\text{F.C.} \times 100}{\frac{\text{F.C.} + \text{Profit}}{2030500} \times 100} = \frac{2,03,500 \times 100}{2,03,500 + 2,89,700} = 41\%$$

Addresses of Machinery Suppliers

(a) Capston Lathe:

1. M/s. Acme Machine Tools Mfg. Co.,
No. 17/1, Belilior Road,
Kadamtala, Howrah-1
2. M/s. Mysore Kirloskar Bros. Ltd.,
Harihar (Mysore).

(b) Lathe:

1. M/s Mysore Kirloskar Bros. Ltd.,
Harihar (Mysore).
2. M/s Batliboi & Co.,
40 Forbes Street, Fort, Bombay-23

(c) Drilling Machine :

1. M/s Perfect Machine Tools Co. (P) Ltd.,
Bell Building, Sir P. M. Road, Bombay.
2. M/s Praga Tools Corpn. Ltd., Secundrabad.
3. M/s Birdi Machine Works, G. T. Road, Ludhiana.

(d) Tool and Cutter Grinder :

1. M/s Hindustan Machine Tools, Bangalore.
2. M/s Batliboi & Co., 40, Forbes Street, Fort, Bombay.

(e) Milling :

1. M/s B. S. Machine Tools Corpn.,
438, Jesore Road, Calcutta.
2. M/s Gilson Machine Tools,
523, Industrial Area 'B', Ludhiana.
3. M/s Prototype Production & Training Centre,
Okhla, New Delhi-20.

(f) Bench Grinder :

1. M/s. Prem Bros.,
7/16, Kirti Nagar Indl. Area, New Delhi.
2. M/s. H. M. Dowel & Sons,
Sharda Nand Marg, Delhi -6.

(g) Furnace :

1. M/s. Hindustan Furnaces, Trichur.
2. M/s. Indian Furnace Co., Lotus Building,
Dr. A. B. Road, Worli, Bombay.

(h) Hardness Tester :

1. M/s. Blue Star Engg. Co.,
Nehru Place, Bhadri House, New Delhi.
2. M/s Fuel Instruments and Engg. (P) Ltd., Ichal Karanji.

(i) Buffing Machine :

1. M/s. Bombay Machinery Co., Delhi-6.
2. M/s. Hindustan Tools Mfg., Co.,
1503, Patodi House, Darya Ganj, Delhi.

Raw Material

(From local market)

(Reserved item Sl. No. 537)

I. Introduction

These nails are of special design meant for fixing shoes to the hooves of animals, such as horses and bullocks. They are rectangular in cross section, with slight taper along the length, finally ending in a point with a short taper edge. The head, which is also rectangular in section tapers gradually down to the stem and is inclined to the axis at an angle of 3 deg. on one side. Nails of various sizes are required.

IB. Market Potential

There is a possibility for development of this product with the demand of this item by DGS&D and in the commercial market.

II. Production Target

51 tons of animal nails of value Rs. 6,48,000 per annum.

III. Production detail and process of manufacture

Good quality nails can be economically made only on automatic machine. These machines are not produced in India and are to be imported. There are few special speed purpose machinery manufacturers who can undertake to produce this type of m/c. on specific orders.

These nails are made from mild steel bright enamled and square wire of carbon content not exceeding 0.18 per cent Silicon 0.2 per cent.

The following operations are involved:

1. Bullock shoe nail heading.
2. Stretching and champering to edges and pointing.
3. Annealing.
4. Barrel polishing and colouring.
5. Packing.

IV. Quality Standards and Specifications

In the absence of ISI specification, other standards such as DGS&D store supplying Drg. No. IND/G3/165 can be availed for product specification. A strict adherence to dimensional tolerance and very smooth finish is essential to prevent damage to the hooves of the animals.

V. Land and Building (rented)

300 sq. metres built up area . . . Rs. 750.00

VI. Machinery and Equipment

	Rs.
1. Automatic Horse Shoe/Bullock shoe nail head punching machines (90 nails) per min. with complete cap dies, one	80,000.00
2. Cutting machine for stretching champering two edges and pointing . one	45,000.00
3. Eccentric power press inclinable type 25 tons cap. for flattening the head one	9,000.00
4. Oil fired furnace, muffle type 6'x6' feet chamber size for Annealing . one	10,000.00
5. Barrel polishing m/c. tumbling barrel size 2-1/2" dia x 4 ft. long one	6,000.00
6. Centre lathe ht. of centre 6-1/2" length of bed 4 ft. one	23,000.00
7. Double ended bench grinder wheel dia. 8" x 1" one	1,400.00
	1,75,150.00
8. Bench drilling machine 1/2" dia. . one	3,500.00
9. Weighing scale, portable—Avery 250 kg. cap. one	1,000.00
10. Erection & installation charges .	15,000.00
11. Work benches, racks, office equipment, tables, etc.	6,000.00
	2,02,650.00

VII. Raw Materials and consumable stores

	Rs.
1. 5 tons of M.S. wire (bright) IS : 7887-1975 annealed (open hearth square wire) @ Rs. 5000/- per ton	25,000.00
2. Consumable store, tools and polishing materials (lacquer) furnace oil, etc. and chemicals	2,000.00
	27,000.00

VIII. Staff and Labour/per month**A. Administrative and Supervisory.**

	Rs.
1. Manager one	750.00
2. Inspector one	450.00
3. Ministerial staff two	800.00
4. Peon one	200.00
5. Chowkidar one	200.00

B. Technical and others.

1. Machine Setter operator	1 no.	500.00
2. Machine operators	3 nos.	1,200.00
3. Semi-skilled workers	2 nos.	600.00
4. Die fitters	1 no.	450.00
5. Helper	1 no.	200.00
		<u>4,400.00</u>
Staff Welfare @ 30%		1,320.00
Total		<u>5,720.00</u>

IX. Other Expenses.

	Rs.
1. Electricity & water	400.00
2. Maintenance & repairs	200.00
3. Printing, postage & stationery	100.00
4. Other consumable stores	100.00
5. Advertisement & publicity	200.00
6. Transportation charges	200.00
7. Taxes	200.00
8. Other miscellaneous	200.00
9. Rent	750.00
	<u>2,350.00</u>

X. Working Capital per month.

	Rs.
1. Raw material	27,000.00
2. Personnel	5,720.00
3. Other expenses	2,350.00
	<u>35,070.00</u>

XI. Capital Investment

	Rs.
1. Machinery & Equipment	202,650.00
2. Working capital for 3 months	1,05,210.00
Total	<u>3,07,860.00</u>

XII. Cost of Production/months

	Rs.
1. Recurring expenses	35,070.00
2. Insurance	300.00
3. Depreciation on machinery & equipment @ 10% (say)	1,690.00
4. Interest on capital investment @ 15%	3,870.00
Total	<u>40,860.00</u>

XIII. Sales proceeds/month

By sale of finished horse shoe & bullock shoe nails of 4250 kg. @ Rs. 12/- per kg. = 51,000.00

XIV. Profitability per month :

Profit : Sales—cost of production Rs. 51,000—40,860 = 10,140.00

Percentage of profit on sales : $\frac{10140 \times 100}{51,000 \text{ (say)}} = 19.9\%$

Percentage of profit on return : $\frac{10140 \times 100}{3,07,860} = 39.6\%$

XV. Break Even point Fixed costs.

	Rs.
Rent	750.00
Interest	3,870.00
Insurance	300.00
Depreciation	1,690.00
40% of Salaries	2,290.00
40% of other expenses	940.00
	<u>9,840.00</u>

Fixed cost x 100 $\frac{9840 \times 100}{19,980 \text{ (say)}} = 49.2\%$

XVI. List of machinery suppliers.

1. M/s. C.A. Willner & Co.
No. 15, Richmond Road, Bangalore-2.
2. M/s. United Precision Industries,
Peenya, Ind. Area, Bangalore.
3. M/s. K.B. Machinery Corporation,
Sultanmund Gate, Amritsar.

XVII. Raw Material Suppliers.

1. M/s. Hindustan Steel Ltd.,
Calcutta.
2. M/s. Modi Steels, Modinagar (UP).

(Reserved item Sl. No. 462)

SIMPLE CONE PULLEY DRIVEN LATHES UPTO 2000 MM BED LENGTH

I. Product and Its Uses

(a) Lathe is a mother machine which is used in any engineering industry, may it be large or small, for production, repair and maintenance. Almost all the machinery operations can be done by this machine. There are various types and sizes but the project profile deals with the manufacture of simple cone pulley driven lathe upto 2000 mm bed length.

(b) Market potential

As lathe is a general purpose machine required in every industry, repair and maintenance works, technical training institutions. The demand is bound to increase with the fast growth in industrial activity. There is also a very good demand of these machines from the developed as well as developing countries.

II. Production Targets

It is proposed to manufacture 4 machines per month.

III. Product Details and Process of Manufacture:

Keeping in view that castings will be available it is proposed to procure the castings from outside to keep the project cost low. The castings are required for the body, carriage, cross slide, head stock, tail stock etc. These items require shaping, planing, boring, drilling and turning etc.

IV. Inspection and Quality Control

This is a simple machine to be used for rough turning work. But to incorporate standardisation and interchangeability it is advisable to prepare the working 'drawings of all the components and procure gauges for the important mating parts. Precision measuring tools such as micro-meters, verniers, dial gauges, surface plate, straight edge etc., have been provided for Quality control.

V. Land and Buildings:

	Rs.
Covered Area 300 sq. metres Rented	1,500.00

VI. Machinery and Equipment:

1. Planner 8' with all electricals	1 No.	20,000.00
2. Planner 6' with all electricals	1 No.	15,000.00
3. Lathe Machine 8' bed with motor starter & electricals	2 Nos.	34,000.00
4. Lathe Machine 6' bed with motor starter & electricals	3 Nos.	30,000.00

5. Lathe Machine 4-1/2' bed with motor starter & electricals	2 Nos.	14,000.00
6. Kirloskar Lathe 6' bed with motor starter & electricals	1 No.	30,000.00
7. Drilling machine 1" cap motorised	1 No.	4,500.00
8. Bench Drill 1/2" cap.	1 No.	1,500.00
9. Hand Drill 1/2" cap	1 No.	2,000.00
10. Grinder Portable 5"	1 No.	1,000.00
11. Bench Grinder 8"	1 No.	1,400.00
12. Boring Machine 50 mm. capacity with electricals	1 No.	80,000.00
13. Milling Machine	2 Nos.	22,000.00
14. Shaper capacity 24"	2 Nos.	24,000.00
15. Tools		5,000.00
16. Installation & erection		28,400.00
17. Office furniture		2,000.00
		<u>3,14,800.00</u>
Sav		3,15,000.00

VII. Raw material Requirements (per Month)

	Rs.
1. Castings 5 tons @ Rs. 2000 per tons	10,000.00
2. M.S. round and sheets etc. 1 ton	3,000.00
3. Bearings and conn metal bushes	2,000.00
4. Hardware goods	5,000.00
	<u>20,000.00</u>

VIII. Staff and Labour per Month)

	Rs.
1. Manager	1 No. 700.00
2. Accountant	1 No. 350.00
3. Foreman	1 No. 800.00
4. Clerk	1 No. 300.00
5. Skilled workers	7 Nos. 2,800.00
6. Semi-Skilled workers	8 Nos. 2,000.00
7. Unskilled workers	6 Nos. 1,200.00
8. Painter	1 No. 350.00
9. Peon	1 No. 200.00
10. Watchman	1 No. 200.00
11. Cost of labour benefits	700.00
	<u>9,600.00</u>

IX. Other Expenses (Per Month)

	Rs.
1 Rent	1,500·00
2 Power & water	100·00
3. Consumable stores	500·00
4. Publicity expenses	500·00
5. Travelling expenses	400·00
6. Oil & Lubricants	200·00
7. Misc. items, stationery, postage etc.	400·00
	<u>4,500·00</u>

X. Working Capital Required (Per Month)

	Rs.
1. Raw materials	20,000
2. Staff and labour	9,600
3. Other expenses	4,500
	<u>34,100</u>

XI. Total Capital Investment:

	Rs.
1. Machinery and equipment	3,15,000·00
2. Working capital for three months	1,02,300·00
	<u>4,17,300·00</u>
Say	4,17,000·00

XII. Cost of Production (per Annum)

	Rs.
1. Raw material (20000x12)	2,40,000·00
2. Salaries (9600x12)	1,15,200·00
3. Other expenses (4500x12)	54,000·00
4. Interest on capital @ 15%	62,550·00
5. Depreciation on machinery @ 10%	31,500·00
	<u>5,03,250·00</u>
Say	5,03,000·00

XIII. Total Sale (Per Annum)

	Rs.
1. By sale of 48 lathes @ Rs. 13000 per year	6,24,000·00
2. By sale of scrap	6,000·00
	<u>6,30,000·00</u>

XIV. Profitability (Per Annum)

Total sale —cost of production	= Profit
Rs. 6, 30,00,000—Rs. 5,03,000	=Rs. 1,27,000·00
(a) Percentage of profit on sale	= $\frac{1,27,000 \times 100}{6,30,000} = 20\%$
(b) Percentage of return over investment	= $\frac{1,27,000 \times 100}{4,17,000} = 30\%$

XV. Break Even Analysis :

$$\text{B.E.P.} = \frac{\text{Annual Fixed cost} \times 100}{(\text{Fixed cost} + \text{Profit})}$$

Fixed cost (per annum)

	Rs.
1. Rent	18,000·00
2. Interest	62,550·00
3. Depreciation on M/c & equipments	31,500·00
4. 40% of salaries	46,080·00
5. 40% of other expenses	14,400·00
	<u>1,72,530·00</u>

$$\text{B.E.P.} = \frac{1,72,530 \times 100}{1,72,530 + 1,27,000} = 56\%$$

XVI. Names and Addresses of Machinery Suppliers :

1. M/s. Cooper Engg. Ltd.
Construction House,
Ballard Estate,
Bombay.
2. M/s. Sarad Engineering Works,
Udyog Nagar,
Bhaktinagar Industrial Estate,
Rajkot (Gujarat).
3. M/s. Kala Machine Works,
No. 119, Shivaji Road,
Shivaji Nagar,
Bangalore-51.
4. M/s. India Machinery Ltd.
29, Strand Road,
Calcutta.
5. M/s. Leading Engg. Works,
31, Rohtak Road,
New Delhi.

(Reserved Item Sl. Nos. 520)

I. Product and its uses

Railway Signals is a very important item for operation of Railways, or its visibility from a distance the signals are always fixed at different heights. It is often necessary to climb that height by maintenance and lighting staff for proper operation of the signals. It is extremely difficult and often not possible to carry a long ladder for this purpose since Railway tracks run through places far away from residential localities. As such it is customary to have a permanently fixed metallic ladder with signal post all along the railway track.

II. Market Potential

Signal ladders require periodical replacement normally before it is absolutely unserviceable since no risk can be taken as it may involve risk of human life so far as maintenance staff is concerned and dislocation of railway traffic in the absence of its operation due to possible un-noticed giving way of the signal ladder. Also to facilitate quick replacement, Railways always maintain ready stock of signal ladders distributed at store rooms located at convenient places. Every year Railway tenders contains items like signal ladder. Since this is a replaceable item there is ready market for the products. With the extension of Railway lines by hundreds of Kilometers every year requirement of signal equipment including signal ladders is also fast growing. Since these ladders are exposed to open atmosphere, rain and other natural hazards the life of the ladders is always very limited. As such there is good market for this item through Railway purchase.

III. Production Target

It is proposed to manufacture 50 pieces of signal ladder per month for the purpose of calculation only ladders of 6 meter length which is a popular size has been taken into consideration.

IV. Product Details and Process of Manufacture

Manufacturing Railway Signal Ladder is simple. The ladders are made in shorter lengths and then built up as per required length. It consists of stay, rung, guard and ladder top. The function of stay is to hold the ladder with post, rung is the stepping rods, guard is for the protection of the person using it, the ladder top is the bend portion at the top of the ladder protecting the guard platform. Ladders are generally of 6/6.5/7.5/8.5 Meter long for build

up purpose and 240 mm wide. The material specification in Steel Grade 'A' (IS 226). The turned end of the rung is rivetted with ladder generally 280 mm apart. With the development of automatic signalling the length, shape of the ladder is little modified but the manufacturing process remains the same.

V. Inspection and Quality Control :

Signal ladders are manufactured according to drawings supplied by Railways. To maintain dimensional accuracy to specified limit in the drawing several templates & guages may be made. Only few template will, however, be necessary since the guiding dimensions will be few in number and more or less of repeative nature. Care should be taken to control the sizes at stages of operation so that in building up to desired length there may not be some distortion or difficulty in assembling.

VI. Land and Building

Covered Area 120 sq. Metres Rented @Rs. 300/- P.M.

VII. Machinery & Equipments

	Rs.
1. Lathe 4' bed with standard accessories, motor, starter and Electricals 2 Nos.	10,000.00
2. Threading machine (Landis type) for 5/8" rod with standard accessories, motor-starter and electricals 1 No.	5,000.00
3. Ball Press No. 8 1 No.	1,500.00
4. Smithy Hearth 4' x 4' with Blower 1 No.	1,200.00
5. Drilling Machine 3/4" capacity motorised 1 No.	1,200.00
6. Bending Fixture fabricated 1 No.	1,500.00
7. Hackshaw machine 6" motorised with other Starter and electricals 1 No.	2,000.00
8. Hand shearing m/c. 3/8" flat 1 No.	1,200.00
9. Hand Tools & Gauges L.S.	2,000.00
	25,000.00
10. Installation & electrification L.S.	3,500.00
11. Furniture, fixture including Office equipment	1,900.00
	31,000.00

III. Raw Materials (per month)

	Rs.
1. M.S. flat $1\frac{1}{2}'' \times \frac{1}{4}''$ 4 M.T.	10,000.00
2. M.S. round 16 mm dia 2 M.T.	5,000.00
3. Bought out items like nuts, bolts etc. L.S.	200.00
	<u>15,200.00</u>

IX. Staff & Labour (per month)

	Rs.
1. Manager 1	800.00
2. Mistry/Supervisor 1	400.00
3. Skilled operator 2	600.00
4. Blacksmith 1	300.00
5. Semi-skilled workers 2	500.00
6. Un-skilled workers 2	400.00
7. Watchman-cum-peon 1	200.00
	<u>3,200.00</u>
8. Cost of labour benefits @ 10%	320.00
	<u>3,520.00</u>

X. Other Expenses (per month)

	Rs.
1. Rent	300.00
2. Electricity	200.00
3. Consumable Tools, Oils, Lubricants and other consumable stores	100.00
4. Hard coke	100.00
5. Cartage & freight	200.00
6. Packing Cost	50.00
7. Publicity	50.00
8. Sales expenses including travelling	100.00
9. Stationery, Postage, Insurance and other miscellaneous expenditure	200.00
	<u>1,300.00</u>

XI. Working Capital Required (per month)

	Rs.
1. Raw materials	15,200.00
2. Staff & Labour	3,520.00
3. Other Expenses	1,300.00
	<u>20,020.00</u>

XIII. Total Capital Investment

	Rs.
1. Machinery & Equipment	31,000.00
2. Working capital for 3 months	60,060.00
	<u>91,060.00</u>
Say	<u>91,000.00</u>

XIII. Cost of Production (per annum)

	Rs.
1. Raw Material	1,82,400.00
2. Staff & Labour	42,200.00
3. Other Expenses	15,600.00
4. Interest on Capital @15%	13,500.00
5. Depreciation on machinery @ 10%	3,100.00
	<u>2,56,840.00</u>

XIV. Total Sale (per annum)

	Rs.
By sale of 600 Nos. of signal ladders 6 meter length @ Rs. 460/- each ladder	2,76,000.00

XV. Profitability

Total Sale—Cost of Production = Profit.
Rs. 2,76,000—2,56,840 = Rs. 19,160.00

(a) Percentage of Profit on sale

$$\frac{19,160 \times 100}{2,76,000} = 7\% \text{ approx.}$$

(d) Percentage of return over investment

$$\frac{19,160 \times 100}{91,000} = 21.0\% \text{ approx.}$$

XVI. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual fixed cost plus profit}}$$

Fixed Cost (per annum)

	Rs.
1. Rent	3,600.00
2. Interest	13,500.00
3. Depreciation on machinery & equipment	3,100.00
4. 40% of salaries	16,896.00
5. 40% of other expenses (excluding rent)	4,800.00
	<u>41,896.00</u>

$$\text{B.E.P.} = \frac{41,896 \times 100}{41,896 + 19,160} = 70\% \text{ approx.}$$

XVII. Names and Addresses of Machinery Suppliers

1. M/s Power Tools & Appliances Co. 2, BBD Bagh, Calcutta-700001.	} Lathe
2. M/s. Leading Engg. Works, 31, Rohtak Road, New Delhi.	
3. M/s. Rajesh Machine Tools, Post Box No. 17, Ghoga Tate, Bombay-1.	
4. M/s. Acme Machine Tools Manufacturing Co. 167/1, Belious Road, Kadamtala	Threading machine (landis type) and Hack saw m/c.
5. M/s. Atlas Works (P) Ltd., 119, Ripon Street, Calcutta-16.	Ball Press
6. M/s. Kala Machine Tools, No. 119, Shivaji Nagar, Bangalore-51.	Drilling Machine

(Reserved item Sl No. 362)

I. Product and Its Uses

(a) There are small (usually 600 mm to about 1000 mm bed length) special purpose lathes for high production of small size components. These machines are much more economical than Capstan or Turret lathes. These machines are more commonly called 'Addas' term signifying its development by the Punjab Industry. These machines have become quite popular all over the country as they are very suitable for the small scale units where capital is limited. The project envisages the manufacture of Heavy Duty 1000 mm bed length machines.

(b) Market Potential

Due to the low cost and high production rate these machines have a very good demand all over the country. With the present Govts. stress on the development of small scale and tiny units, there will be tremendous demand for these machines. There is also likely to be a very good demand for these machines from the developing and under developed countries as Indian technology in the small scale sector has been well received in these countries. Moreover a Number of turnkey projects are being set up in these countries based on this technology.

II. Production Target

It is proposed to manufacture 4 machines per month.

III. Production Details and Process of Manufacture

Keeping in view that castings will be available, it is proposed to procure the casting from outside to keep the project cost low. The castings are required for the body, bed, head stock, carriage and cross slide etc. These items require shaping, drilling and boring operations. The other important items are gears, lead screw, spindle, camps, levers etc., which again required turning, drilling, boring, milling operations. Suitable machines have, therefore, been provided in the scheme.

IV. Inspection and Quality Control

These machines are normally custom made depending upon the operations to be carried out and the size of part. Not much standardisation and inter-

changeability is possible. Precision measuring instruments like micrometers, veniers, dial gauge, surface plate, straight edge etc., can be used to control various sizes.

V. Land and Building

	Rent Rs.
250 sq. meters	
Covered area 20 × 7 meters rented . . .	600.00

VI. Machinery and Equipments

	Rs.
1. Planner 6' with all Electricals . . . 5 Nos.	15,000.00
2. Lathe 6' Kirloskar with motor starter & electricals. 3 Nos.	30,000.00
3. Lathe 6' bed with motor starter and electricals 2 Nos.	10,000.00
4. Lathe 4½" with motor and starter . . . 3 Nos.	14,000.00
5. Drilling Machine 1" cap. Motorised . . 1 No.	3,000.00
6. Bench Grinder 12" 1 No.	1,000.00
7. Hand Drill (Wolf) ½" cap. (Portable)	1,000.00
8. Shaper 24" Stioke with motor starter etc. 3 Nos.	12,000.00
9. Hand Grinder	1,000.00
10. Workshop Tools and precision measuring tools i.e. vernier, Micro etc. etc.	2,500.00
11. Installation and erection	8,700.00
12. Office furniture equipment	1,500.00
	99,700.00
Say	1,00,000.00

VII. Raw Material Requirements (per month)

	Rs.
1. Castings 2.0 M. T.	4,600.00
2. Bearings	600.00
3. Steel Section i.e. M. S. Rounds 0.4 M. Tons. . .	1,200.00
4. Hardware items i.e. Nut & Bolts	400.00
	6,200.00

VIII. Staff and Labour (per month)

	Rs.
1. Accountant-cum-clerk	350.00
2. Chowkidar-cum-Peon	200.00
3. Sweeper part time	50.00
4. Foreman	600.00
5. Skilled worker 8 Nos.	2,400.00
6. Unskilled workers 2 Nos.	400.00
	4,000.00

IX. Other Expenses (per month)

	Rs.
1. Electricity & Water	400.00
2. Consumable Tools	200.00
3. Oils & Lubrication	100.00
4. Rent	600.00
5. Publicity Expenses	200.00
6. Travelling Expenses	200.00
7. Miscellaneous paint etc.	300.00
	<u>2,000.00</u>

X. Working Capital Required (per month)

	Rs.
1. Raw Material	6,200.00
2. Staff & Labour	4,000.00
3. Other Expenses	2,000.00
	<u>12,000.00</u>

XI. Total Capital Investment

	Rs.
1. Machinery & Equipment	1,00,000.00
2. Working capital for three months	36,000.00
	<u>1,36,000.00</u>
Say	1,37,000.00

XII. Cost of Production (Per Annum)

	Rs.
1. Raw material	74,400.00
2. Salaries	48,000.00
3. Other Expenses	24,000.00
4. Interest on capital investment @15%	20,500.00
5. Depreciation on machinery @10%	10,000.00
6. Sales expenses.	10,000.00
	<u>1,86,900.00</u>

XIII. Sales Proceeds

	Rs.
By sale of 48 machines 1000 mm bed heavy duty @Rs. 5,000/- per machine	2,40,000.00

XIV. Profitability

Total Sale—Cost of Production=Profit
Rs. 2,40,000 (—) Rs 1,86,900=53,100

(a) Percentage of profit on sale $\frac{53,100 \times 100}{2,40,000} = 22.12\%$

(b) Percentage of Return on investment = $\frac{\text{Profits per annum}}{\text{Capital investment}}$

$$= \frac{53,100 \times 100}{1,37,000} = 38.7\%$$

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Profit} + \text{Fixed Cost}}$$

Fixed Cost	Rs.
1. Rent	7,200.00
2. Interest	20,500.00
3. Depreciation	10,000.00
4. 40% of Salaries	19,200.00
5. 40% of Other Expenses	9,600.00
	<u>56,500.00</u>

$$\begin{aligned} \text{B.E.P.} &= \frac{56,500 \times 100}{56,500 + 53,100} \\ &= \frac{56,500 \times 100}{1,09,600} = 50\% \end{aligned}$$

XVI. Name and Addresses of Suppliers Machinery

1. M/s. Punjab Engineering Co., G.T. Road, Miller Ganj, Ludhiana.	Planner Machine
2. M/s. Cooper Engineering Co. Ltd., Construction House, Ballard Estate, Bombay-1.	Do.
3. M/s. Leading Engineering Works, Rohtak Road, New Delhi.	Lathe
4. M/s. Rajesh Machine Tools, Post Bag No. 17, Ghogha Gate, Bombay-1.	Lathe
5. N/s. Kala Machine Tools, No. 119, Shivaji Road, Bombay-51.	Drilling Machines
6. M/s. Acme Manufacturing Co. Limited, Construction House, Ballard Estate, Bombay.	Shaper
7. M/s. India Machinery Ltd., 29, Strand Road, Calcutta.	Shaper

(Reserved item Sl. No. 521)

I. Product and Its Uses

Snap fastners are press buttons mainly used in ladies and childrens' dresses and hosiery goods. The set consists of two parts—male and female which pin together or fasten together when pressed. As this is a consumer item, the demand is always on the increase and therefore there shuld not be much problem in marketing.

II. Production Targets

The project envisages the manufacture of 18,000 gross (about 26 lakh pieces) per month.

III. Production Details and Process of Manufacture

The manufacturing process of snap fastners is fairly simple. Male and female parts are separately manufactured out of brass strips in automatic machines. The parts are then degreased and Nickle plated in barrels and dried. The finished product is then set on cards with the hands. The complete set of machines is imported.

IV. Inspection and Quality Control

IS : 4741-1968 is available and the item should be manufactured and tested as per the standard. The dies and punches should be regularly checked for any wear to ensure proper sizes of the male and female fitting portions.

V. Land and Building

Land 200 sq. metres with covered area of at least 120 sq. metres (Rented) Rs. 750.00

VI. Machinery and Equipments

The plant consists of the following :

- 1. 25 Tonnes Eccentric Press with—2 Sets material feeding and take up device complete with 2 H. P. Electric Motor (3 PH 440/440 V) and starter.
- 2. Automatic spring insert machine with dies, wire strengthening device, material feeding and take up device. —5 Sets
- 3. Dies for male and female parts —1 Set each.
- 4. Hydro extractor 12" dia with 1 H. P. 3 ph. 50 cycle 400/440 V Ac Motors & Starters —1 set.
- 5. Tumbler for polishing —1
- 6. Tumbler for removing oil —1

- 7. Tumbling barred for washing —1
 - 8. Planting kettle for Nickle plating made of copper (including Oil burner) —1
 - 9. Aluminium and brass basket for picking —1 set
 - 10. Installation & Electrification etc. furniture, office equipment etc.
- Rs. 3,00,000.00

Note—The prices have been taken on approximation and may be revised at the time of implementation).

VII. Raw Material Requirements (Per Month)

- 1. Brass strip
 - 2. Spring wire
 - 3. Nickle ingot.
 - 4. Card paper etc.
- Rs. 25,000.00

VIII. Staff and Labour (Per Month)

- 1. Manager —1 700.00
 - 2. Accountant-cum-Clerk —1 400.00
 - 3. Store-keeper —1 350.00
 - 4. Chowkidar —1 200.00
 - 5. Supervisor —1 500.00
 - 6. Skilled workers —3 1,050.00
 - 7. Helpers —4 800.00
- Rs. 4,000.00

IX. Other Expenses (Per Month)

- 1. Power and Water 600.00
 - 2. Consumable tools and dies 500.00
 - 3. Repair and Maintenance 250.00
 - 4. Oils and Lubricants etc. 150.00
 - 5. Packing Materials 750.00
 - 6. Publicity Expenses 250.00
 - 7. Postage and Stationery 150.00
 - 8. Travelling Expenses 200.00
 - 9. Telephone and Miscellaneous Expenses. 400.00
 - 10. Rent 750.00
- Total Rs. 4,000.00

X. Working Capital Requirement (for 3 montht)

	Rs.
1. Raw Materials 25,000x3	= 75,000·00
2. Staff and labour 4,000x3	= 12,000·00
3. Other expenses 4,000x3	= 12,000·00
	<u>99,000·00</u>

XI. Total Capital Investment

	Rs.
1. Machinery and Equipments	3,00,000·00
2. Working Capital for 3 months	99,000·00
	<u>3,99,000·00</u>

XII. Cost of Production (Per Annum)

	Rs.
1. Recurring expenses 99,000x4	= 3,96,000·00
2. Interest on capital @ 15%	= 59,850·00
3. Depreciation on machinery and equipments@ 10%	= 30,000·00
4. Sales Expenses	= 6,000·00
	<u>4,91,850·00</u>
Say	<u>4,92,000·00</u>

XIII. Sale Proceeds (Per Annum)

	Rs.
By sale of 2,16,000 gross (311 lakh pieces) at Rs. 2.75 per gross	5,94,000·00

XIV. Profitability (Per Annum)

Profit=Sales—Cost of Production =5,94,000—4,92,000 =1,02,000	
(a) Percentage of Profit on sales.	$= \frac{1,02,000 \times 100}{4,94,000} = 17.1\%$
Percentage of return on capital	$= \frac{1,02,000 \times 100}{3,99,000} = 25.5\%$

XV. Break even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual fixed cost} + \text{Profit}}$$

Annual Fixed Cost

	Rs.
1. Rent	9,000·00
2. Interest	59,850·00
3. Depreciation	30,000·00
4. 40% of Salaries	19,200·00
5. 40% of other expenses	13,600·00
	<u>1,31,650·00</u>
Say	<u>1,32,000·00</u>

Break Even Point

$$\begin{aligned} &= \frac{1,32,000 \times 100}{1,32,000 + 1,02,000} \\ &= \frac{1,32,000 \times 100}{2,34,000} \\ &= 56.3\% \end{aligned}$$

XVI. Sources of Supply of Machinery and Equipments

1. M/s Walter Trovel Carl, Kurt, Walther GMBH, West Germany.
2. M/s Moll & Co. Mechinen Fabrik Wuppertal, Bonn, West Germany.
3. M/s H.F. Cordes & Co. Hamburg, West Germany.

XVII. Sources of Supply of Raw Material

Brass strip of 0·2X55 mm and 0·23X43 mm.

1. M/s Kamani Metal & Alloys Limited, L.B. Sastri Marg, Bombay-70.
2. M/s Indian Smelting and Refining Co. Ltd., Sastri Marg, Bombay-78.
3. M/s Shalimar Agencies Co., Madras-1.

(Reserved item Sl. No. 390).

I. Product and Its Uses

(a) Spanners are hand tools used for various operations by hand while not using power. These are required mainly in fitting work and in engineering workshop. Apart from this these are used by the owners of vehicles also.

(b) Market Potential

Spanners of different types and sizes are the items that no industrial unit can do without. As such the demand for spanners emanates mostly from the repair and servicing workshops. The growth of workshops and increase in number of vehicles on the road in turn depend on the general industrial developmental in the area. Keeping in view the future industrial development and factors governing demand, the future demand for spanners is expected to rise by about 5 per cent during the next five years.

(c) Basis and Presumptions

This scheme has been prepared on the basis of 75 per cent efficiency on single shift considering 25 working days in a month.

The rate of interest in the scheme has been taken on the basis of 15 per cent at an average; however, this figure is likely to vary depending on the financial outlay of the project as well as location of the unit.

The break-even point in the scheme has been calculated on the full capacity utilisation basis.

One set of spanners consists of six pieces. The sets comprise the following sizes:

6x7 mm	12x13 mm
8x9 mm	14x15 mm
10x11 mm	16x17 mm

The cost of the machinery and equipment items as indicated refer to a particular machine and the prices are approximately those ruling at the time of preparation of this scheme.

The provisions made in other respects viz., raw material, personnel, utilities, overheads etc., are drawn on the basis of standard operations and average outputs and the costs indicated against each are approximate and based on local markets, conditions and observations.

The forging die shall be made in the workshop itself with the tool room machinery provided in the scheme.

No operation will be carried out outside the workshop.

II. Production Capacity (Per Annum)

Quantity	120,000 sets
Value	Rs. 19,80,000

III. Product Details and Process of Manufacture

Process Outline

1. Blanking
2. Forging
3. Trimming
4. Normalising
5. Grinding
6. Broaching & Straightening
7. Hardening & tempering
8. Shot blasting
9. Finishing
10. Electroplating

IV. Quality and Specifications

The products shall be manufactured as per the recommendations laid down by the ISI No. IS-2028-1968. The spanners shall be suitably heat-treated to produce an ultimate tensile strength of 116-147 Kg/Sq. mm and hardness corresponding to 35-45 Reckwell.

V. Land and Building

	(Rupees)
Land	—1000 sq. metre
Covered area	—400 sq. mtrs. (Rented) 4,000.00
Motive Power	—150H.P.

VI. Machinery and Equipment

S. No.	Description	Indigenous/ Imported	Qty	Prices (Rs.)
(1)	(2)	(3)	(4)	(5)
1.	Drop Forging hammer 1 ton, 50 H.P. Motor.	Indigenous	1 no.	1,85,000.00
2.	Power press, 100 tons 10 H.P. Motor	Do.	1 no.	45,000.00

S. No. (1)	Description (2)	Indigenous/ Imported (3)	Qty (4)	Prices (Rs.) (5)
3.	Power press 50 tons 7½ H.P. Motor	Indigenous	1 no.	30,000·00
4.	Broaching Machine 15 tons, 7½ H.P. Motor	Do.	2 nos.	1,60,000·00
5.	Belt grinder 5 H.P. Motor	Do.	2 nos.	10,000·00
6.	Shot blasting M/c 20" × 27" size 10 H.P. Motor	Do.	1 no.	50,000·00
7.	Oil fired furnace 1100C 100 Kg/hr. with blower, burner & pyrometer 3 H.P. motor	Do.	1 no.	15,000·00
8.	Tempering furnace upto 750° C & 450 mm dia. 20 kW.	Do.	1 no.	36,000·00
9.	Hardening furnace 1000° C & Chamber size (1½' × 1½' × 1½' size)	Do.	1 no.	45,000·00
10.	Electroplating Equipment including rectifier, 10 H.P. Motor	Do.	1 no.	40,000·00
11.	Flexible shaft grinder 1 H.P. Motor	Do.	1 no.	5,000·00
				6,21,000·00
<i>Tool Room Section</i>				
1.	Lathe Machine 8' capacity (Heavy duty) 3 H.P. Motor	Do.	1 no.	20,000·00
2.	Shaper 24" capacity (Heavy Duty) 3 H.P. Motor	Do.	1 no.	18,000·00
3.	Vertical Milling M/c No. 2·5 H.P. Motor	Do.	1 no.	25,000·00
4.	Drilling M/c 25 mm capacity 1 H.P. Motor	Do.	1 no.	5,000·00
5.	Surface grinder (Heavy Duty) 3H.P. Motor (250 × 450 mm)	Do.	1 no.	25,000·00
6.	Double ended grinder 10" × 1" wheel 1 H.P. Motor	Do.	1 no.	3,000·00
7.	Hacksaw Machine 12" blade ½ H.P. Motor	Do.	1 no.	5,000·00
				1,01,000·00
Total				621,000 + 101,000 = 722,000·00
Installation & Electrification charges @Rs. 10%				B/F (Rs.) 722,000/- 72,200·00
<i>Testing Equipment</i>				
	Rockwell Hardness Tester		1 no.	5,000·00
	Torque Tester		1 no.	10,000·00
				8,09,200·00

Lifting chain block with overhead trolley.	10,000·00
Tools, dies & Instruments.	1,00,000·00
Office furniture & equipment.	10,000·00
	9,29,200·00

VII. Raw Materials (Per Month)

EN-18 EN-47 EN-50, 8 tons @Rs. 6000·00 per ton	48,000·00
Electroplating material such as electroplating metallic salt anodes acids polishing material etc.	Rs. 10,000·00
	58,000·00

VIII. Staff and Labour (Per Month)

1. Manager.	1	1,000·00
2. Engineer.	1	1,000·00
3. Office Assistant.	13	1,200·00
4. Supervisors.	2	1,200·00
5. Draftsman.	1	500·00
6. Watchman.	2	400·00
7. Sweeper.	1	200·00

Technical-Skilled and Unskilled.

1 Skilled workers @ 400·00 each.	16	6,400·00
2. Semi-skilled workers @ 225/-each.	15	3,375·00
3. Unskilled workers @ 200·00 each.	8	1,600·00

Total (Salaries) 16,875·00

Say 16,900·00

(+) Perquisites @ 15% of Salaries. 2,535·00

Total 19,535·00

Say 19,500·00

IX. Other Expenses.

(a) Utilities (Per Month)

Power	Rs 6,000·00
Oil	1,500·00
Furnace Oil	2,000·00
Water	500·00
	10,000·00

(b) Overhead charges (Per Month)

Maintenance & Repair	2,000·00
Postage Stationery & Telephone	1,500·00
Advertisement.	2,000·00
Transportation.	2,000·00
Consumable Stores.	2,500·00
Travelling Expenses.	1,000·00
Insurance.	1,000·00
Taxes.	150·00
Packing charges.	10,000·00
Misc. Expenditure.	1,000·00
	23,150·00

X. Total working Capital (per month)		Rs.
1. Staff & Labour.		19,500.00
2. Raw Material.		58,000.00
3. Utility.		10,000.00
4. Overhead charges.		23,150.00
5. Rent.		4,000.00
		<u>1,14,650.00</u>
Say		<u>1,14,700.00</u>

XI. Total Capital Investment.		
1. Fixed capital.		9,29,200.00
2. Working capital for 2 months.		2,29,300.00
Total		<u>11,58,500.00</u>

XII. Cost of Production (per year)		
1. Working capitals.		13,76,400.00
2. Depreciation on M/c & equipment @ 10%		67,520.00
3. Depreciation on furnace @ 20%		27,200.00
4. Depreciation on dies and fixtures.		10,000.00
5. Depreciation on Office furniture & equipment.		1,000.00
6. Interest on total capital investment @ 15%		1,73,775.00
		<u>16,55,895.00</u>
Say		<u>16,55,900.00</u>

XIII. Sales Proceeds (per year)		Rs.
Spanners 1,20,000 sets @ 16.50 per set.		19,80,000.00

XIV. Profitability		
Net profit per year (before Income Tax)		19,80,000.00
		<u>(—)16,55,900.00</u>
		<u>=3,24,100.00</u>

Percentage of profit over sales=16%
Percentage of return on investment=27%

XV. Break Even Analysis.

$$\text{Break-even Point} = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Sales} - \text{Annual Variable Cost.} = 54\%}$$

XVI. Name and Addresses of Machinery Manufacturers.

1. M/s. Niranjan Singh Kartar Singh Forging Pvt. Ltd. Link Road Industrial Area A Ludhiana-3.	Forging Hammers
2. M/s. Frances Klen & Co. Carrol Road, Bombay-13.	Do
3. M/s. Indu Udyog Co. Pvt. Ltd. 40, Okhla Industrial Estate, New Delhi-20.	Broaching M/c
4. M/s. Indian Hydraulics Pvt. Ltd. Najafgarh Road, New Delhi.	Do.
5. M/s. Atlas Works (P) Ltd. No. 119, Ripon Street Calcutta.	Power Press.
6. M/s. Basant Mechanical Works, Basant Road 720—723 Industrial Area B Ludhiana-3.	Do.
7. M/s. Indian Furnace Co. Ltd. Lotus Cinema Building 1/2—A Dr. Annie Besant Road Bombay-18.	Oil Fired Furnace.
8. M/s. Larson & Toubro Ltd. Powai, Bombay.	Shot Blasting M/c
9. M/s. Punjab Machinery Corporation [G-77, West Nizamuddin New Delhi.	Do.
10. M/s. Ashoka Machine Tools A/15, Mayapuri Industrial Area New Delhi.	Lathe
11. M/s. Rajesh Machine Tools Post Bag No. 17, Ghogha Gate, Bhavnagar (Gujarat).	Do.
12. M/s. Sethi Industries 819/397, Shadipur Near West Patel Nagar Bus Stand New Delhi.	Belt Grinder Pedestal Grinder
13. M/s. Canning Mitra Phoenix Ltd. 187, Dr. Dada Bhai Naoroji Road Bombay-1.	Electroplating Tank
14. M/s. Fuel Instruments & Engineers Private Limited Ichalkaranji (MS).	Hardness Tester.

VII. Raw Material Suppliers

Raw materials from open market and
also through Government depots.

(Reserved item Sl. No 413).

I. Product and Its uses

Spokes, nipples and washers are one of the main components of rim assembly of auto cycles, motor cycle, and moped wheel assembly. These are required for new vehicles as well as for replacement purposes.

With the growth of two wheelers, three wheelers, auto cycles, etc., the demand for this item would increase.

II. Production Target

Spokes, Nipples & Washers 60,000 Gross at a value of Rs. 18,00,000/-. The manufacture of this item is based on automatic machine.

III. Production Details and Process of Manufacture

Process Outline

- Spoke steel wire is cut to the required lengths from coil with straightening device, head upset and bent. The other end is thread rolled. All those operations are done by one automatic machine.
- Brass wire in coil is fed and nipple blanks are headed or upset.
- The headed nipples are finished by roughing and drilling and finish drilling, square milling, slot milling and threading with one automatic & 6 station head machine.
- Punching and stamping of washers.
- Spokes and the washers are nickel plated and assembled.

IV. Quality Control and Standards

IS specification No. 630-1959 may be followed for product standards. Thread snap gauges and plug gauges are used to check the thread parts.

V. Land and Building (Built up Area rented)	800.00 p.m.
Working shed 40×100 . . . sq. ft. = 4,000	
Office and stores 30×40 . . . = 1,200	

VI. Machinery and Equipment

- Automatic Universal spokes making machine with straightening device cutting of device feeding and equalising device, head upsetting and head bending device thread rolling attachment

with one set of tools wire of one dia. collecting cradle for spokes machine to be fitted with flywheel and built in friction clutch arranged for motor drive clutched with reducing gears speed of gear unit 350 rpm.

Motor 3 HP-400/440 V/50 cycle with V rope pulleys moultd on the machine, machine output 80 spokes per minute complete with spare tools etc.

Rs.

ONE	85,000.00
2. Automatic upsetting machine for manufacture of nipple blanks out of brass wire with straightening and cutting of device and one set dies for nipples with necessary electric motor 3HP—output of machine 160 nipples/minute	ONE 45,000.00
3. Automatic Nipple blanks finishing machine with one set of tools for one size of nipple, machine equipped with inlet part, feeding device centring device rough & finish drilling device, square milling, slot milling device, thread cutting with turret head round with working attachment are set complete with motor 3 HP and coolant pump.	ONE 1,80,000.00
4. Automatic punching & stamping machine for manufacture of bent washers for spokes 10 tons cap. equipped with feeding device punching and forming tools for one size of washer and production of 3 washers per stroke of machine, motor 1 HP — output 350 washers per rim.	ONE 30,000.00
5. Nickel plating equipment complete with rectified, degreasing washing and drying plant.	ONE 50,000.00
6. Centre lathe ht. of Centre 6½" length of bed 4 ft.	ONE 20,000.00
7. Tool and cutter grinder 'ADDISON' type hand operated.	ONE 18,000.00
8. Bench drilling machine ½" capacity.	ONE 3,000.00
9. Double ended bench grinder wheel 8".	ONE 1,500.00
10. Set of spare tools for the machines.	IS 5,000.00
11. Workshop measuring instrument and gauge.	IS 5,000.00
12. Office equipment, work benches etc.	8,000.00
13. Erection & installation of Machines.	15,000.00
Total	4,65,500.00

VII. Raw Materials (per month)

Particulars	Imported Indigen- ous	Qty.	Rate Rs.	Value (Rs.)
1. High carbon steel wire tensile strength 70 tons/sq. in-10s to 8swg. wire	Indigen- ous	10 tonnes	4,500 per ton	45,000.00
2. Brass wire for nipples	Do.	3 tonnes	6,000 per ton	48,000.00
3. Steel strip 20 BG thickness for washer.	Do.	2 tonnes	5,000 per ton	12,000.00
				<u>1,05,000.00</u>

VIII. Staff and Labour (per month)

Personnel

(Administrative and Supervisory)

1. Manager-cum-Engineer	1	1 200.00
2. Foreman	1	750.00
3. Inspector	1	450.00
4. Store-keeper & Clerk	1	450.00
		<u>2,850.00</u>

Technical—(Skilled and Unskilled)

1. Machine & Die setter	1	500.00
2. Semi-skilled worker	4	1,200.00
3. Unskilled workers (packers)	2	300.00
4. Chowkidar	2	300.00
5. Sweeper	1	100.00
		<u>2,400.00</u>
TOTAL SALARIES		5,250.00
+ perquisites @ 15% of salaries		790.00
		<u>6,040.00</u>

IX. Other contingent Expenses (per month)

Water & Power charges	350.00
Rent	800.00
Postage & Stationery	300.00
Telephone	250.00
Consumable stores (drills, centre drills, slitting cutters, square mil-ling, cutters, taps, threading, dies, spare header dies etc. Lubricant, coolant, elec. plating salt chemicals, etc.)	6,000.00
Repairs and Maintenance	350.00
Transport charges	350.00
Advertisement & Publicity	400.00
Insurance	300.00
Taxes	300.00
Sales expenses	400.00
Miscellaneous expenditure	500.00
	<u>9,950.00</u>
Say	10,000.000

X. Total Recurring Expenditure (per month)

Rs.
1,21,300.00

Total Working Capital (on 3 months basis)

3,63,900.00

XI. Total Investment

(i) Fixed capital	4,65,500.00
(ii) Working capital	3,63,900.00
	<u>8,29,400.00</u>

XII. Cost of Production (per year)

Total recurring cost per year	14,55,600.00
Depreciation on machinery and equipment @10%	46,450.00
Interest on total investment @ 15%	1,24,060.00
Total	<u>16,26,110.00</u>

XIII. Sales Proceeds

Sales	18,00,000.00
Cost of Production	(—) 16,26,110.00
	<u>1,73,890.00</u>

XIV. Profitability

Sales-Cost of Production= Profit = Rs.	1,73,890.00
Profit per year × 100	
Turnover per year	
173,890 × 100	
= 18,28,000	
Percentage of profit over sales	
= Approximately 9.7%	
Percentage of Return	
Profit per year × 100	
Total Investment	
1,73,890 × 100	
= 8,28,400	
= Approximately = 21%	

XV. Break-even analysis (% of total production envisaged)

(i) Fixed Cost	
(a) Depreciation on Machinery and equipment	46,500.00
(b) Rent on building	9,600.00
(c) Interest on total investment	1,24,060.00
(d) Insurance	36,000.00
(e) 40% Salary & Wages	28,900.00
(f) 40% other contingent expenses (excluding rent & insurance)	42,480.00
	<u>2,87,490.00</u>

(ii) Net Profit per year = 1,73,890.

BEP = $\frac{\text{Annual fixed cost} \times 100}{\text{Annual Sales} - \text{Annual variable cost}}$
= 38% approximately.

XVI. Addresses of Machinery and Equipment suppliers.

1. M/s. I.J. Mehta & Sons.
142, Kapada Street,
Fort, Bombay-1.
2. M/s. Perfect Machine Tools Co.,
Bell Building, Sir PM Road,
Bombay.
3. M/s. Protas Engineering Co.,
6th Radial Road,
Connaught Place,
New Delhi.
4. M/s. H.S. Shobha Singh & Sons.
16/17, Mera Mausion
Customs House Road,
Bombay.
5. M/s. Kewalsons Cycle Industry,
DEF Industrial Area,
Najafgarh Road,
Delhi.
6. M/s. Hindustan Industries,
GT Road,
Ghaziabad.
7. M/s. Standard Metal Fabrication Co.,
Narayana Industrial Area,
Phase I,
New Delhi.
8. Guru Nanak Engineering Works,
Kahnuwan Road,
Simbla, Batala,
Punjab.

(Reserved items Sl. Nos. 682 and 720).

I. Product and Its Use

Auto lamps are one of the most important items in the vehicle. No vehicles are manufactured without the auto lamps. These lamps are used for spot lighting and is used in front centre of the vehicle.

II. Market Potential

Auto lamps require replacement when it is absolutely unserviceable since no risk can be taken as it may involve risk of human life during driving the automobile. Every year the production of automobiles are increasing and as such the auto lamps are also being used in each vehicle. So there is a good market for this item.

III. Production Target

It is proposed to manufacture 3500 pcs., of spot lamp per month. For the purpose of calculation the lamps for Ambassador car has been taken into consideration. The shape, size and design changes according to the type of vehicle.

IV. Product Details and Process of Manufacture

The entire Auto lamp assembly consists of the various components viz., Reflector, metal ring rivetted with holder, rubber connector, transparent plastic cover, wire terminals, Bakelite spacers, springs, screw & nut. Reflector and metal ring is a sheet metal component and is processed by pressing operation in press machine followed by metal treatment for perfect illumination. Other parts like rubber, bakelite & plastic cover are bought out components which are assembled with galvanised screw & washer. Each lamp assembly first packed with polythene packet and then in the printed card Board box.

V. Inspection and Quality Control

Auto lamps are generally manufactured with the drawings and design of parent vehicle industry. Care should be taken in all steps for its interchangeability. Plating takes a vital role for the better reflection. So it is advisable to get the plated components tested from recognised test houses.

VI. Land and Building

	Rs.
Covered area 60 sq. meter Rented . . .	150.00 p.m.

VII. Machinery and Equipment

		Rs.
(1) Geared hand lever shearing m/c. cap. 16 SWG.	1 no.	950.00
(2) 30 ton power press with 5 H.P. motor & accessories.	1 no.	12,500.00
(3) Double arm ball press No. 12	1 no.	2,500.00
(4) Bench Drill with 1/2 H.P. Motor	1 no.	850.00
(5) Tapping Machine with 1/2 H.P. motor	1 no.	3,400.00
(6) Dies & punches	L.S.	4,000.00
(7) Hand tools, measuring instrument	L.S.	2,000.00
		26,200.00
(8) Installation & electrification	L.S.	2,800.00
(9) Furniture & Fixture including office equipment		2,000.00
		31,000.00

VIII. Raw materials per month

(1) C.R.C. sheet 20 gauges & 22 gauges	700 kg.	3,500.00
(2) Rubber connector (bought out item)	3500 nos.	700.00
(3) Plastic covers bought out item)	3500 no.	1,050.00
(4) Wire, galvanised screws & nuts, bakelite, springs etc.	L.S.	500.00
		5,750.00

IX. Staff and Labour per month

1. Manager	1 no.	640.00
2. Supervisor	1 no.	400.00
3. Skilled operator	2 nos.	600.00
4. Unskilled labour	3 nos.	600.00
5. Watchman-cum-peon	1 no.	200.00
		2,400.00
Cost of labour benefit @ 10%	1 no.	240.00
		2,640.00

X. Other Expenses per month

1. Rent	150.00
2. Electricity	200.00
3. Consumable tools, oil, lubricants & other consumable tools	100.00
4. Galvanising & plating charges	1,000.00
5. Carriage & freight	100.00
6. Packing cost	300.00
7. Publicity	50.00
8. Sales expenses including travelling	100.00
9. Stationery & other machine expenses	100.00
	2,300.00

XI. Working Capital Required (per month)

	Rs.
1. Raw material	5,750.00
2. Staff & labour	2,640.00
3. Other expenses	2,300.00
	<u>10,690.00</u>

XII. Total Capital Investment

1. Machinery & equipment	31,000.00
2. Working capital for 3 months	32,070.00
	<u>63,070.00</u>
Say	63,000.00

XIII. Cost of Production (per annum)

1. Raw material	69,000.00
2. Staff & labour	31,680.00
3. Other expenses	
4. Interest on capital @ 15%	9,450.00
5. Depreciation on m/c. @ 10%	3,100.00
	<u>1,40,830.00</u>

XIV. Total Sale (per month)

By sale of 42,000 nos. Spot lamp @ 3.60 each	1,51,200.00
By sale of recoverable scrap	6,900.00
	<u>1,58,100.00</u>

XV. Profitability

Total sale—cost or production	Profit
Rs. 1,58,100.00 1,40,730.00	17,370.00
(a) Percentage of profit— $\frac{17,370 \times 100}{1,58,100}$	= 7.8 %
(b) Percentage of profit on investment— $\frac{17,370 \times 100}{63,000}$	= 28 %

XVI. Break Even Analysis

B.E.P.	$\frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{profit}}$
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Fixed Cost (per annum)

1. Rent	1,800.00
2. Interest	9,450.00
3. Depreciation on m/cs. & equipment	3,100.00
4. 40% salary	12,800.00
5. 40% other expenses (excluding rent)	11,320.00
	<u>38,470.00</u>

$$\text{B.E.P.} = \frac{38,470 \times 100}{55,840} = 62\%$$

XVII. Names and Address of Machinery Suppliers

1. M/s. Power Tools & Appliances Co.
123, Mount Row, Madras-6.
2. M/s. Atlas Works (P) Ltd.,
119, Ripon St., Calcutta-16.
3. M/s. Kala Machine Tools,
119, Shivaji Nagar,
Bangalore-57.

(Reserved item Sl. No. 644).

I. Product, its Uses and Potential

Spray guns are generally made use of in the following: (1) Spray painting (2) Metal Spray and (3) Sand blasting gun. Apart from these there are other types of spray guns which are used for spraying of compressed air and other sprayers for pesticides and insecticides.

The spray guns, most commonly and widely used for painting purposes, are available in two modles; (1) Top cup type (Gravity feed spray gun with nozzle) (2) Botton Cup type (Suction feed spray gun with nozzle). These spray guns can be made for different capacity to hold the liquid. The generally used capacities are 1 pint and 2 pint. There are other designs in the spray gun like artist small pencilled type, light weight spray gun with nozzle, air blow guns and oil spray guns etc. Further models such as universal line stripping gun for making stripping both vertical and horizontal position equipped with interchangeable, swivel wheel heads attached with guides regulating flow value provided with finger grip handle and flow meter for capacities upto 2 ounce are also generally used in painting application.

The product range as indicated above are common types used as a spray painting kit along with air compressors. Different brands of spray gun are available in the market in different models. Since the parts of the spray guns have to be replaced after certain usage there is a scope for this type of industry. The item can be marketed separately as a kit or a part of the spray painting equipment along with the Compressor. The operation of the spray gun will depend on the jet caps which can be held as interchangeable to work under different pressures to spray different viscas liquid. Commonly used specifications are spray guns with jet caps to work at 25 psi and 45 psi with 1/2 pint container, also 60 psi with one pint container capacity.

The project profile is based on the above range capacity of spray guns for painting purposes. Further the items such as brass forged jet caps, gravity die cast aluminium finger-grip-handle and regulating flow-value housing may be sub-contracted out and machining of these items for finish products may be processed in the unit for economic viability.

II. Production Capacity (Per Annum)

Quantity 4000 Nos. of assorted capacity sizes, types and models.

Value Rs. 70 average size of 1/2 pint capacity, 45 psi with adjustable type jet cap.

III. Process Outline

The main parts of the spray gun are (1) metallic container, generally made of brass sheet or aluminium deep drawn and metallised spun with bottom threaded lid. The container neck can also be made separately by deep drawing process and the body portion separately formed. The cast brass ring may be machined and threaded to suit the lid. All the three portions are brazed and soldered together. (2) Regulator valve housing and finger grip generally made of aluminium die casting or gravity casting. The part is machined for the air flow and also for mounting the regulating assembly. The regulating spring loaded finger-lever is also mounted on the container, either at the bottom or top according to the design. (3) Finger lever is made of brass sheet blanked and formed to shape, drilled, electroplated and assembled on to the finger handle grip housing, suitably plunger. (4) Jet cap is a forged brass blank, machined to the shape and press-fitted on jet nozzle. (5) Jet Nozzle is made of stainless steel rod turned and drilled to the required size. (6) Air hose nozzle-Mild steel hexagon rod turned and threaded. (7) Regulator nozzle pin-EN-1 bright steel round rod and taper pin turned to the required size. (8) Jet cap outer ring-Brass hollow cast ring, turning, Knurling, boring and inside threading to suit the spray gun finger handle housing on the side of the jet cap. (9) Inner adjustable jet control pin guide piece-Hexagonal mild steel or drilling, threading and turning. (10) Assembly of all above parts and testing.

IV. Quality Control and Standard

Inspection and quality control for air leaks and jet spray adjustment have to be carried out for spray efficiency.

V. Land and Building

12 x 10 metres—Rented

Rs.
500.00 p.m.

VI. Machinery and Equipment :

Rs.

1. Centre lathe 4' bed Harihar MBD make or similar	-1 No.	30,000·00
2. Turret lathe chucking type bar cap. 35 mm penomat or similar make	-1 No.	30,000·00
3. Capstan lathe bar cap. 25 mm 3ft. bed with hex. turret head, G.D. Wailer or similar type, with thread chasing attachment-machine suitable for both bar work and chuck work, complete with standard accessories etc.	-1 No.	35,000·00
4. Gas welding set	-1 No.	3,000·00
5. Hand Press No. 6	-1 No.	1,500·00
6. Hand Press No. 4	-1 No.	1,200·00
7. Bench drilling machine high speed type ½" cap.	-1 No.	4,500·00
8. Air compressor 100 psi with 20 lit cap. regulator hosepipe etc.	-1 No.	3,500·00
9. Hand Tools and equipments Electrification and installation charges-approximately		1,500·000

Total cost of machinery & equipment

1,16,200·00

(ii) Office equipment & Furniture

1,000·00

1,17,200·00

VII. Raw material (per month)

1. Aluminium alloy castings L. M. 9 @ 200 Kgs @ Rs. 20/-	4,000·00
2. Brass rods of 10mm and other assorted sizes 100 kgs. @Rs. 30/-	3,000·00
3. Screws, springs etc.	200·00
4. C. R. C. A. Sheets, deep drawn, 16swg or 18 swg. 100 kg. @Rs. 10/-	1,000·00
5. Electrification charges etc.	500·00
	8,700·00

VIII. Staff and Labour (Per Month)

(Personnel)

1. Manager	1 No.	800·00
2. Foreman	1 No.	600·00
3. Skilled workers 5 Nos. @Rs. 400/-		2,000·00
4. Unskilled workers 3 Nos. @Rs. 300/-		900·00
5. Typist cum clerk	1 No.	300·00
6. Watch man	1 No.	200·00

Total Salaries
+Perquisites 15% of salary

4,800·00

720·00

5,520·00

IX. Other expenses

(a) Utilities (per month)

1. Power 15 H.P.	Rs.	400·00
2. Water 20,000 lit		50·00
		450·00

(b) Other Contingent Expenses :

Rs.

1. Rent	500·00
2. Postage and Stationery	100·00
3. Consumable stores	500·00
4. Repair & maintenance	300·00
5. Transport charges	200·00
6. Advertisement & Publicity	150·00
7. Insurance	1,100·00
8. Sales Expenses	200·000
	3,050·00
	450·00
	3,500·00

+(a)

Total

X. Total Recurring Expenditure

1. Salaries	5,520·00
2. Raw Materials	8,700·00
3. Utilities	450·00
4. Other contingent expense	3,050·00
	17,720·00

Total working capital for 3 months :
Rs. 17,720·00 × 3 =

53,160·00

XI. Total Capital Investment

1. Fixed Capital	1,17,200·00
2. Working capital	53,160·00
	1,70,360·00

XII. Cost of Production (per year)

Total recurring cost per year	2,12,640·00
Depreciation on machinery and equipment @10%	1,137·00
Depreciation on office equipment @Rs. 20%	400·00
Interest on total investment	25,554·00
	1,39,731·00

XIII. Sales Proceeds

Turnover (per year) 4000 Nos. of assorted size spray guns and air guns at Rs. 70/ each

2,80,000·00

XIV. Profitability

Rs.

Net Profit per year	=2,80,000·00
	(-) Rs. 2,39,731·00
	=Rs. 40,269·00
Percentage of Profit on sale	Profit/year = 100
	Turnover
	40,269 × 100
	= 2,80,000
Percentage of profit on investment	Profit year × 100 =
	Capital investment

$$\frac{40,269 \times 100}{1,70,360}$$

23.7%

XV. Break even analysis

(a) Fixed Cost :

	Rs.
1. Depreciation on machines and equipment	1,137.00
2. Rent	6,000.00
3. Interest on total investment	25,540.00
4. Insurance	1,100.00
5. 40% of salary and wages	2,208.00
6. 40% of other contingent expenses	860.00
	<u>36,859.00</u>

(b) Net fixed cost = Rs. 36,900.00
Break even point :— Fixed Cost $\times$ 100

Fixed Cost + Profit

$$\frac{36,900 \times 100}{36,900 + 40,269} = \frac{36,900 \times 100}{77,169} = 48\%$$

XVI. Name and Addresses of the Machinery Suppliers

1. M/s. Paramount Machine Tools Corporation
812, Industrial Area-B.
Ludhiana-3. Lathe of all type
2. M/s. Batliboi & Co. —
Narasimharaja Road,
Bangalore-560002.
3. M/s. Alfred Herbert (India) Ltd. — Do.
Asaf Ali Road,
New Delhi.
4. M/s. Arograph & Co. — Gas Wed
No. 8/10A,
Bazar Road Cochine
Kerala.
5. M/s. Indian Expeller Works (P) Ltd. — Hand Press
No. A-4 Naroda Indl. Estate —
Naroda, Ahmedabad.
6. M/s. Prem Tools Corporation. — Air Compressor.
Plot No. 408/410 Sub. Plot No. 13
Near Super Drycleaners
Gultekdr. Poona-411009.

(Reserved item Sl. No. 677).

I. Product and Its Uses :

Measuring tools are of immense use in engineering industries to maintain correct sizes of the jobs. Spring Calipers were of frequent use in the past. However, now a days these have been replaced to some extent by the 'Go and Not Go' Gauges for production jobs but still these are used to maintain the sizes of the parts of low accuracy and for job type works.

Spring Calipers are of two types viz. Out side Calipers and Inside Calipers. These are used to measure the out side and inside diameters respectively. This project envisages the manufacturing of Spring Calipers of 150X200 mm sizes.

Small engineering units are developing in India at a very fast rate. As such there is very good scope of marketing in all the States.

II. Production Targets :

The project envisages the manufacture of 24,000 sets of inside and out side Calipers per annum.

III. Production Details and Process of Manufacture :

The Spring Calipers consist of two curved strips of sheet metal hinged together at one end with a rivet. For maintaining the position at the required opening to check the same size again and again a threaded pin is fixed on one strip which passes through bush on the other strip. When the nut is tightened or loosened on the threaded pin the two side strips can come closer or move apart. For quick opening a spring steel strip is fitted at the hinger end.

The strips are cut on the press. The nut, threaded pin and bush are turned on the lathe and assembled.

IV. Inspection and Quality Control :

I.S. : 4052-1967 spring Calipers is available.

The manufacturing of the item is quite simple and does not involve much precision. The care should be taken for the sizes of pin and nut for inter-changeability.

V. Land and Building :

	Rs.
Covered area 100 sq. metres (Rented)	500/- p. m.

VI. Machinery and Equipments :

	Rs.
1. Power Press 50 Tonnes capacity complete with 3 H.P. 400/440 V. 3 phase Electric Motor and starter	1 15,000.00
2. Power Press 20 Tonnes capacity complete with 1.5 H. P. 400/440 V 3 phase Electric Motor and starter	1 8,000.00
3. Power Press 10 Tonnes capacity complete with 1 H. P. 400/440 V 3 phase Electric Motor and Starter	1 6,500.00
4. Special Purpose Lathe Machine bed length 2½' complete with 1 H.P. 400/440 V 3 phase Electric Motor and starter	2 1,000.00
5. Tapping Machine with Motor ½" cap.	1 1,500.00
6. Bench Type drilling machine ½" cap. complete with 0.5 H.P. Electric Motor	1 1,500.00
7. Double ended bench grinder 8" wheel size	1 1,500.00
8. Tools, dies, Jigs and Fixtures	L.S. 10,000.00
9. Installation and Electrification etc.	4,500.00
10. Office furniture and equipments	1,500.00
Total fixed investment	56,000.00

VII. Raw Materials (Per month)

1. B.P. Sheet 8 to 12 Gauge thick 500 kg. @ Rs. 500/- per Tonne	2,500.00
2. M.S. Bright bar 3 mm to 12mm cap. 200 kg. @ Rs. 3,000/- per Tonne	600.00
3. Spring steel sheet/strip 14 to 16 Gauge 200 Kg. @ Rs. 6,000/- per Tonne	1,200.00
	4,300.00

VIII. Staff and Labour (per month)

	Rs.
1. Foreman	1 500.00
2. Skilled Workers	5 1,750.00
3. Semi-skilled workers	3 750.00
4. Watchman	1 200.00
5. Helper	1 200.00
6. Accountant/Clerk (part Time)	1 200.00
	3,600.00

IX. Other Expenses (per month) :

	Rs.
1. Electricity and Water	200.00
2. Oils and lubricants	50.00
3. Repairs and Maintenance	150.00
4. Consumable Tools, dies etc.	250.00
5. Freight, Cartage, Travelling etc.	400.00
6. Heat Treatment charges	150.00
7. Packing and Forwarding	150.00
8. Miscellaneous expenses	250.00
9. Rent	500.00
	<u>2,000.00</u>

X. Working Capital (per months) :

1. Raw Material Rs. 4,300x3	12,900.00
2. Staff and labour Rs. 3,600x3	10,800.00
3. Other expenses Rs. Rs. 2,000x3	6,000.00
	<u>29,700.00</u>

XI. Total Capital Investment:

1. Fixed Investment on Machinery and Equipments	56,000.00
2. Working capital for 3 months	29,700.00
	<u>85,700.00</u>
Say	<u>86,000.00</u>

XII. Cost of Production (Per annum):

1. Recurring expenses 29,700x4	1,18,800.00
2. Interest on capital @ 15%	12,900.00
3. Depreciation on Machinery @ 10%	4,000.00
4. Depreciation on Tools, Dies and Equipments @ 20%	3,500.00
5. Sales Expenses	5,000.00
	<u>1,44,200.00</u>
Say	<u>1,44,000.00</u>

XIII. Sales Proceeds (per annum):

By sale of 24,000 sets @ Rs. 7.50 per set

Rs.
1,80,000.00**XIV. Profitability :**Profit = Totals Sales—Cost of Production
= 1,80,000—1,44,000; = 36,000/-(a) Percentage of Profit on sale $\frac{36,000 \times 100}{1,80,000} = 20\%$ (b) Percentage of Return over Capital investment $\frac{36,000 \times 100}{86,000} = 41.8\%$ **XV. Break Even Analysis :**B.E.P. = $\frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Fixed Cost} + \text{Profit}}$ **Annual Fixed Cost**

	Rs.
1. Rent	6,000.00
2. Interest on Capital	12,900.00
3. Depreciation	7,500.00
4. 40% of Salaries	17,280.00
5. 40% of Other expenses	7,200.00
	<u>50,880.00</u>

$$\text{B.E.P.} = \frac{50,880 \times 100}{50,880 + 36,000} = \frac{50,880 \times 100}{86,880} = 58\%$$
XVI. Suppliers of Machinery and Equipment :

1. M/s. Baliboi and Co. (P) Ltd.,
190-A Frbes Street,
Bombay-400001.
2. M/s. Bansant Industries,
Industrial Area-B.
Ludhiana-141003.
3. M/s. Mankoo Industries
Industrial Area-B.
Ludhiana-141003.
4. M/s. Power Tools and Appliances Co.,
2-B, B.D. Bagh
Calcutta-700001.
5. M/s. Perfect Machine Tools Co., (P) Ltd.,
Bell Building, Sir, P. N. Road,
Bombay-400001.
6. M/s. T.A. Engineering Corporation,
Janta Nagar,
Ludhiana-141003.

Note : Raw material are available in the Market.

(Reserved item S. No. 758).

M & M Industries 85 SQUARE TIN CONTAINERS (18.5 LITRES)

I. Product Details and Its Uses

This scheme envisages the manufacture of 18.5 litres capacity square tins. These tins are most commonly used as containers in edible and non-edible oil industries.

The manufacturing process is very simple. As the machines are hand operated, these machines can be operated even by semi-skilled workers after some training. The machinery and equipments incorporated in the scheme are envisaged to manufacture about 1500 square tins per day of 8 hours at 100 per cent efficiency. The raw material, workers and staff etc., have also been worked at this level of working. However, in case any unit intends to produce only 750 tins per day of 8 hours, treadle guillotine shearing machine and seaming of top and bottom machine can be reduced to one each only.

Proportionately the requirements of staff and labour as well as raw material can also be reduced in case the capacity envisaged is only 750 tins/day. Normally, for production of 1500 tins per day of 8 hours, 8 to 10 solders operators are required. The main raw material is tinned M.S. sheet in 30, 31 and 32 SWG thickness.

II. Market Potential

Though the scarcity of raw material plays a very important role on the growth of this industry, manufacture of tin containers is developing since there is ever increasing demand for the same. The tin sheets have to be obtained from M/s. Hindustan Steel Ltd., and M/s. Tin Plate Committee of India. Necessary application for allotment of raw material has to be made through the Directorate of Industries & Commerce of the concerned state. The item, in general, offers scope when set up near the consumer centres.

III. Land and Building

Total built up factory area—2500 sq. (approx) —rented
Rs. 2000.00 p.m.

IV. Quality Control and Standards

Indian Standard specification No. IS : 916/1976 deals with the tin containers. The tin containers are checked for leakage of joints for 100% of the production.

V. Machinery and Equipments

		Rs.
1. Shearing machine, treadle operated, capacity to cut 36" width sheets for cutting tin sheets into pieces for top, bottom and side bodies	2 No. @Rs. 4000/- each.	8,000.00
2. 2nd operation Body notching machine for trimming four corners of half body blanks, foot operated	1 No.	2,000.00
3. 3rd operation 18.5 litres multi-operated, double pillar type heavy duty fly press suitable for :—	1 No.	18,000.00
(1) Double sided border emboss		
(2) Both side hooks for side seam		
(3) flanging on both ends.		
(4) letter embossing design and		
(5) half radius bend of 45° on one and all operations in single stroke complete with its upper fly wheel, manually operated.		
(b) 18.5 litres multi-operated die, suitable to take over specified five operations, with upper punch	1 No.	7,000.00
4. 4th operation Square body bending machine to form flat body in angle 90°, hand operated	1 No.	1,200.00
5. 5th operation Heavy duty double pillar type fly press fitted with special attachment for double side locking tools to side seam both opposite corner simultaneously, complete with upper fly wheel, manually operated	1 No.	9,000.00
6. 6th operation Heavy duty 2 pillar type fly press suitable to form top bottom cutting with embossing in single stock with upper fly wheel manually operated	1 No.	10,000.00
7. Combination operated 18.5 litres top bottom cutting with embossing die complete with top steel punch buffered springs double washers	1 No.	7,000.00
8. 7th operation Filler hole cutting with embossing fly press complete with its upper fly wheel manually operated	1 No.	3,000.00
9. Filler hole cutting embossing die with its top steel punch one die only	1 No.	600.00

10. 8th operation

Filler hole's cap cutting with embossing fly press complete with its upper fly wheel manually operated 1 No. 3,000.00

11. Filler hole's cap cutting with embossing die of steel with its top steel punch-one die only. 1 No. 600.00

12. 9th operation

4 gallon top and bottom double seaming machine to close top & bottom of square cans complete with one seaming chuck and a pair of steel tempered rollers manually operated 2 Nos. 19,000.00

@Rs. 9,500
each

13. Special attachment to be fitted with seaming machine equipped with gears bearings and stand. 2 Nos. 6,000.00

@Rs. 300
each

14. Forming fixing clips and handles

(a) Wire cutting machine manually operated-one only 1 no. }
(b) Wire cutting machine manually operated-one only 1 no. } 25,000.00
(c) Handle fixing die of steel with top punch-one only 1 no. }

15. Testing of cans

Manually operated air compressor machine for testing of cans, foot operated-one only 1 no. 3,000.00

Electrification and erection charges (approx.) 10,000.00

Total cost of machinery and equipments. 1,32,400.00

or say 1,32,000.00

VI. Raw Material (per month)

1. Tinned sheets for 37,500 square tins (of 18.5 litres cap.) at 1.2 kg. per tin inclusive of wastages, rejections etc. 45 MTS 3,15,000.00

@Rs. 7000/-
per
tonne

2. Soldering lead (40% tin 60% lead approx.) @ approx. 5 kg. per 1000 tins for 37500 tins. 187 kg. 20,570.00

@ approx. Rs.
110/-
per
kg.

3. G.I. Wire for handles at approx. Rs. 60/- per 1000 tins for 37500 tins. 2,250.00

Total 3,37,820.00

or say 3,40,000.00

VII. Salary and Wages (per month)

Rs.
1. Manager-cum-salesman. 1 @ Rs. 750 750.00
2. Tin Foreman 1 @ Rs. 600 600.00
3. Machine operator 13 @ Rs. 300 3,900.00

5,250.00

4. Helpers. 10 @ Rs. 250 2,500.00

5. Solders. 8 @ Rs. 200 1,600.00

6. Container tester 2 @ Rs. 200 400.00

35 9,750.00

Fringe benefits like PF, Bonus, ESI etc. at 25% of salary and wages 2,487.00

Total 12,237.00

Or say 12,200.00

VIII. Miscellaneous Items of Expenditure (Per month)

1. Lighting (lumsum) 50.00

2. Water sanitation etc. 100.00

3. Stationery postage etc. 100.00

4. Repair and maintenance 100.00

5. Renewal of dies tools, etc. 250.00

6. Transport 200.00

7. Travelling, advertisements, sales promotion 200.00

8. Rent. 2,000.00

Total 3,000.00

IX. Working Capital (3 montht)

1. Salary and wages (Rs. 12,200 × 3) 36,600.00

2. Raw material (Rs. 3,40,000 × 3) 10,20,000.00

3. Misc. expenditure (Rs. 3000 × 3) 9,000.00

Total 10,65,600.00

X. Total Investment

1. Machinery and equipments 1,32,000.00

2. 3 months' working capital 10,20,000.00

Total 11,97,600.00

or say 11,97,000.00

XI. Manufacturing Cost (Annual)

1. Salary and wages (Rs. 12,200 × 12) 1,46,400.00

2. Raw material (Rs. 3,40,000 × 12); 40,80,000.00

3. Misc. expenditure (Rs. 3000 × 12) 36,000.00

4. Depreciation on machinery and equipments @ 10% 13,200.00

5. Interest on total investment @ 15% on Rs. 11,97,000/- 1,79,550.00

Total 44,55,150.00

or say 44,55,000.00

XII. Sales Proceeds (Annual)

By sale of about 4,50,000 nos. of 18.5 litre tins @ approx. Rs. 10.50 per tin 47,25,000.00

XIII. Profitability (Annual)

Rs.

By sales	47,25,000.00
Towards manufacturing cost	44,55,000.00
Gross profit/year (before taxation)	2,70,000.00

$$\text{B.E.P.} = \frac{\text{Fixed Cost} \times 100}{\text{Fixed cost} \times \text{Profit}} = \frac{2,67,390 \times 100}{2,67,390 + 2,70,000} = 50\%$$

XIV. Profit.

Percentage Profit over sales 2,70,000.00

$$= \frac{2,70,000 \times 100}{47,25,000} = 5.6\%$$

Percentage Profit on return

$$= \frac{2,70,000 \times 100}{11,97,000} = 22.5\%$$

XV. Break Even Point

Fixed Cost.

1. Interest	1,79,550.00
2. Depreciation	5,280.00
3. 40% Salaries and wages	68,560.00
4. 40% other expenses	14,000.00
	2,67,390.00

XVI. Suppliers of Machinery and Equipments including Dies etc.

1. M/s. Jethwa Container Machinery Works, Jethwa Industry House, No. 1, Favourise Industrial Estate, Masarani Lane, Hallay Bridge, Kurla West, Bombay-70.
2. M/s. Ashok Metal Industries, Tagao Road, Bhakti Nagar, Rajkot-21 (Gujarat).
3. M/s. Bhadur Engg. Works, Pazhayattinkulhi, Pallimuku, Quilon (Kerala).
4. M/s. Amateep Machine Tools (P) Ltd., 14/7, Mathura Road, Faridabad (Haryana).

(Reserved item Sl. No. 369)

STAPLING MACHINE (HAND)

1. Product and Its Uses

Hand staplers are manufactured in various sizes. These are used for bunching of papers which make a completet set. This product is categorised as stationary item.

Market Potential

The product is widely used in offices, factories, bookshops, schools and by individuals. Even grocery shop owners now-a-days find that the stapling of the paper bags is handy and convenient and prefer it in place of old method of using cotton thread to the packages. As such a good market prevails for the product.

II. Production Targets

This project envisages the manufacture of 5000 staplers per month.

III. Process of Manufacture

Sheets of requisite gauges are cut in size on the shearing machine. These strips are then given the shape on the power press and fly press.

Painting and plating is done on various parts and then assembled.

It is proposed that the Springs (coil), rivets will be procured from the market. Heat treatment of leaf springs and plating of the components will be given to sub contractors outside.

IV. Inspection and Quality Control

All the components should be inspected to fine tolerances. The adopter end and top which presses staple pins should have accurate clearances, otherwise the machine will not work to satisfaction.

V. Land and Building.

Covered Area 200 Sq. meter rented	Rs. 1,000.00
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VI. Machinery and Equipment.

1. Power press 20 ton capacity with 2HP motor.	1 No.	15,000.00
2. Shearing Machine 40"×16" skote with 2 HP motor.	1 No.	11,500.00
3. Drilling machine 1/4" capacity with 5 HP motor.	1 No.	2,500.00
4. Fly Press No. 4.	1 No.	1,000.00
5. Rivetting Machine 1/2" capacity with 5 HP motor.	1 No.	3,000.00
6. Dies Tools, figs, & fictures etc.	—	5,000.00
7. Installation & Electrification.	—	4,000.00
8. Office furniture etc.	—	2,500.00
		4,4500.00

VII. Raw Material Requirement (per month)

	Rs.
1. C.R.C.A. Sheet 165 width 1.6 Ton @ 5000 per ton.	8,000.00
2. Spring Steel 1/2" width 100 kg. @ Rs. 10/-Kg.	1,000.00
3. Rivets & Eyelets.	500.00
4. M.S. Wire 1/8" dia 100 Kg. @Rs. —Rs. 3 per Kg.	9,800.00
5. Bought out components Plastic , Springs etc.	2,000.00
6. Electroplating cost etc.	500.00
7. Packaging Materials	500.00
8. Misc. items.	300.00
	13,100

VIII. Staff and Labour (Per Month)

1. Manager	1 No.	800.00
2. Supervisor	1 No.	500.00
3. Inspection	1 No.	350.00
4. Clerk cum typist	1 No.	300.00
5. Skilled workers	3 Nos.	1,200.00
6. Semi skilled workers.	4 Nos.	1,000.00
7. Helpers	1 No.	200.00
8. Packer	1 No.	200.00
9. Watchman.	1 No.	200.00
10. Cost of Labour benefits.	—	650.00
		5,400.00

IX. Other Expenses (Per Month)

1. Rent	1,000.00
2. Power and water	500.00
3. Maintenance & repairs	200.00
4. Consumable stores	200.00
5. Advertisement & Publicity	500.00
6. Travelling expenses	500.00
7. Transport etc	500.00
8. Stationery & Postage etc	100.00
9. Misc. expenses.	500.00
	4,000.00

ing Capital Required (Per month)

	Rs.
1. Raw Material	13,100.00
2. Staff and Labour	54000.00
3. Other expenses	4,000.00
	<u>22,500.00</u>

XI. Total Capital Investment

1. Machinery and equipment	44,500.00
2. Working capital for 3 months	67,500.00
	<u>112,000.00</u>

XII. Cost of production (per month)

1. Raw Material (13100 × 12)	1,57,200.00
2. Salaries (5400 × 12).	64,800.00
3. Other expenses (4000 × 12)	48,000.00
4. Interest on capital investment @15%	16,800.00
5. Depreciation on Machinery and equipment 10%	4,450.00
	<u>2,91,250.00</u>

XIII. Total Sale (per month)

By sale of 60,000 Staplers @Rs. 5.40 3,24,000.00

XIV. profitability (per month)

Total Sale—Cost of Production.

Rs. 3,24,000/- = Rs. 2,91,000/- = Rs. 33,000/-

(a) Percentage of Profit $\frac{33,000 \times 100}{3,24,000}$

10%

(b) Percentage of return $\frac{33,000 \times 100}{1,12,000}$

29%

XV. Break even Analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{(\text{Fixed cost} \times \text{Profit})};$$

Annual fixed cost. (Per Annum).

	Rs.
1. Rent	12,000.00
2. Interest	16,800.00
3. Depreciation on machine & equipment	4,450.00
4. 40% of salaries.	21,120.00
5. 40% of other expenses.	19,200.00
	<u>73,570.00</u>

$$\text{B.E.P.} = \frac{73,570 \times 100}{(73,570 + 33,000)} = 69\%$$

XVI. Name and Address of Machinery suppliers.

1. M/s. Manik Lal & Sons,
119, Narayan Dhum Street,
Bomday.
2. M/s. Batliboi & Co. Pvt. Ltd.,
26, R.N. Mukherjee Road,
Calcutta.
3. M/s. Ashok Metal Industries,
Tagore Road,
Rajkot (Gujarat).
4. M/s. Atlee Works Pvt. Ltd.
119, Rippon Street,
Calcutta-16.

(Reserved item S. No. 774).

I. (a) Product and Its Uses

Steering wheels are used in automobiles. This is very important item of automobile fitted in the Assembly of Steering column. The wheel is made up of alloy steel ring core of sizes ranging from 6 mm to 10 mm with spokes welded on the ring frame. The fabricated steering subsequently covered with rubber by compression moulding in any hydraulic press. After painting the steering wheel is ready for use. There are different sizes of steering wheels for which different dies are required.

(b) Market Potential

Although there is not much demand for replacement market, but there is large scope for this item for the supply to Automobile manufacturers. This item is marketed direct to automobile manufacturers as well as through DGS&D to different Government departments.

II. Production Target (Per annum)

S. No.	Name of item	Qty.	Value	Total
1.	Steering Wheels	7500	Rs. 55.00 each	4,12,500.00

III. Product Details and Process of Manufacture

The process for the manufacture of Steering Wheel is as under:—

1. Cutting of Wire
2. Forming of ring
3. Welding
4. Covered with rubrised ebonite compound
5. Heat in the compression moulding press
6. Cleaning
7. Grinding
8. Painting
9. Baking
10. Fitting of Horn Switch
11. Packing.

IV. Inspection and Quality Control

1. There is no ISI Specification for this item and are to be manufactured based on requirement design, quality and the specification as per automobile manufacturers.

2. For maintaining quality control, the material to be used of best quality.
3. Epoxi paint should be used.
4. Smooth surface should be made before painting.

V. Financial Aspects**1. Fixed Capital.**

(i) Land and Building	Rented
Covered area 150 sq. metre @ Rs. 10/- per sq. metre	1,500.00 (P.M.)

(ii) Machinery and Equipment**(a) Production Unit**

Sl. No.	Description	Indigenous/ Imported	Qty.	Price (Rs.)
1.	Hydraulically operated 100 ton compression moulding machine with electric motor and necessary accessories	Indigenous	1	25,000.00
2.	Rubber mixing mill 24" size	"	1	25,000.00
3.	Extruder 1' dia. cap.	"	1	15,000.00
4.	Compressor with Spray Gun	"	1	5,000.00
5.	Heating Chamber Electrically heated 5' x 5' x 5'	"	1	20,000.00
6.	Boiler 100 lbs/psi 2000 lbs. evaporation and Chamber 6' x 2' dia.	"	1	15,000.00
7.	Elect. welding set 220 amp. 440 volts (5 KVA)	"	1	3,000.00
8.	Lathe 4½'	"	1	12,000.00
9.	Bench type drilling machine 1½" cap	"	1	2,500.00
10.	Spot Welding m/c 2 KVA	"	1	1,500.00
11.	Polishing & buffing m/c.	"	2	5,000.00
				1,29,000.00
(b) Testing Equipment				
Measuring instruments such as micro-meter, V. caliper etc.				2,000.00
(c) Electrification and Installation charges				
@ 10% of cost of machinery & equipment				13,000.00
				1,44,000.00

	Rs.
(iii) Cost of fixtures/moulds & dies	50,000·00
(iv) Cost of office equipment/working tables etc.	5,000·00
(v) Pre-operative expenses	1,000·00
	<u>2,00,000·00</u>

2. Working Capital (per month)

(i) Personnel

Designation	No.	Salary	Total (Rs.)
(Administrative & Supervisory)			
1. Manager	1	800	800·00
2. Accountant-cum-Store-keeper	1	500	500·00
3. Clerk-cum-Typist	1	300	300·00
4. Peon/Chowkidar Technical—skilled & Unskilled	2	200	400·00
5. Foreman	1	600	600·00
6. Skilled Worker	3	350	1,050·00
7. Semi-skilled worker	3	250	750·00
8. Helper	2	200	400·00
Total (Salaries)			<u>4,800·00</u>
(+) Perquisites @ 15% of Salaries			700·00
			<u>5,500·00</u>

(ii) Raw materials including Packaging requirements (per month)

Particulars	Indigenous/ Imported	Qty.	Rate	Value Rs.
1. M. S. Rod 6 mm to 8 mm dia	Indigenoues	300 Kg.	Rs. 3/- per kg.	900·00
2. Natural rubber/ SBR Rubber Reclaimed rub- ber/Carbon black clay zinc oxide sulphur, solvent oil etc.	"	"	"	3,000·00
3. Paint (Epoxi)	"	25 lit.	Rs. 80/- per lit.	2,000·00

Brought out components

1. Hub (Pressure die casted)	"	625	Rs. 8/- per pc.	5,000·00
2. Horn fittings	"	625	Rs. 3/-	1,875·00
				<u>12,775·00</u>

Particulars	Indigenous/ Imported	Qty.	Rate	Value Rs.
(iii) Utilities (per month)				
Power	"	"	"	450·00
Water	"	"	"	50·00
				<u>500·00</u>

(iv) Other contingent expenses (per month)

1. Rent	"	"	"	1,500·00
2. Postage & Stationery	"	"	"	50·00
3. Telephone	"	"	"	200·00
4. Consumable stores	"	"	"	250·00
5. Repair/Maintenance/Dies	"	"	"	500·00
6. Transport charges	"	"	"	250·00
7. Advertisement	"	"	"	100·00
8. Insurance	"	"	"	100·00
9. Taxes	"	"	"	50·00
Total	"	"	"	<u>3,000·00</u>

(v) Total recurring expenditure (per month)

21,775·00

(vi) Total Working Capital (on 3 months basis)

65,325·00

3. Total Capital Investment

(i) Fixed Capital 2,00,000·00

(ii) Working Capital for 3 months 65,325·00

2,65,325·00

4. Cost of Production (per year)

1. Total recurring cost per year	2,61,300·00
2. Depreciation on machinery and equipment	12,900·00
3. Depreciation on Dies & Fixtures @ 20%	10,000·00
4. Depreciation on Measuring instrument @ 20%	400·00
5. Depreciation on Office equipment @ 15%	750·00
6. Interest on total investment @ 15%	39,800·00
	<u>3,25,150·00</u>

5. Turn over (per year)

Item	Qty.	Rate	Value (Rs.)
Steering Wheel	7500	Rs. 55/-	4,12,500·00
6. Net Profit per year (5 — 4)			4,12,500·00
			<u>3,25,150·00</u>
			87,350·00
7. Net profit ratio			21%
8. Rate of Return			33%
9. Break even point			50%

0. Address of Machinery Suppliers

1. M/s. Channa Bros.
26 Okhla Indl. Area, New Delhi-20

2. M/s. bading Engg. Works
New Rohtak Road,
Anand Parbat, New Delhi-5.

3. M/s. Mahalakshmi Engg. Works
26 D.L.F. Industrial Area,
New Delhi.

4. M/s. Kala Machine Tools
119 Shivaji Road,
Shivaji Nagar, Bombay-51.

5. M/s. K. G. Khosla & Co.,
Mathura Road, Faridabad.

6. M/s. Manjeet Engg. Works,
71/1 Najafgarh Road, Delhi.

7. M/s. J. B. Advani Oerlikon,
Ashoka Estate
Barakhamba Road, New Delhi.

8. M/s. Malik Electric Works,
13 Victoria Road, Low Level,
Bombay -10 DD.

9. M/s. Tajindra Elect. Works,
42 G.B. Road, Delhi.

Lathe

Bench
drilling m/c.

Compressor
with Gum

Elec. Welding set &
Gas welding set

10. M/s. Simplicity Engg. Works
B-99 Mayapuri Indl. Area,
Phase I New Delhi.

11. M/s. Narang Scientific Works
Indl. Area, Naraina
Phase II, New Delhi.

12. M/s. Indu Udyog,
40 Okhla Indl. Estate,
New Delhi.

13. M/s. Sehgal Bros. Engg.
2505 Teliwara, Delhi-6.

14. M/s. Anand Engg. Works,
Sirhand (Punjab).

15. M/s. Premier Engg. Works,
Sirhand (Punjab).

16. M/s. Slach Engg. Works,
15 Najafgarh Road,
New Delhi.

Heating
changer

Hydraulic operator
Compression
moulding machine

Rubler mixing
mill, Extruder

(Reserved item Sl. No. 641).



I. Product and Its Uses

(a) Steel cots are a substitute for the conventional wooden cots used by common men living both in rural and urban areas. The cots are normally made out of mild steel conduit pipe and these in comparison to the wooden cots are lighter in weight and stronger and cannot be eaten away by the moths, white ants and thus have longer life and from the health point of view they are safer to use. The folding cots are more suitable for use in small rooms particularly in big cities and can be stacked in less floor area. On the top they are woven either with Ban or Niwar (cotton/nylon).

(b) Market potential

The demand for steel cots is steadily growing with the increase in population, construction of new residential area, and the standard of living. Apart from the common buyer, it has market avenue with the Police Departments, Defence Department and other similar organisations who have to put up camp offices.

II. Production Target

It is proposed to manufacture the two types of cots:—

- (a) fixed type steel cot 3,000 Nos. per annum on single shift basis, and
- (b) folding type cot with nylon top 3,000 Nos. per annum.

The installed capacity for the unit will be 9,000 cots per annum on per shift basis.

III. Product Details and Manufacturing Process

The mild steel conduit pipes are cut to length according to the size of cot. The pipes are then bent to shape on the pipe bending fixture. Thereafter the joints are welded and the supporting members are riveted. In case of niwar type cots the holes are drilled to take the self tapping screws on the length and breadth of the frame. The members are fitted and assembled and painted. The holes are drilled to screw the nylon niwar in the cots.

IV. Inspection and Quality Control

The conduit pipe should be used with proper diameter and wall thickness and the overall size to be checked. The frame should be tested for the load capacity.

V. Land and building

Covered area 150 sq. metres (rented) Rs. 1,500·00

VI. Machinery and Equipment

Sl.No.	Name of the machine	Qty.	Value
			Rs.
1.	Pipe bending fixture (Lever type) complete with 20 to 50 mm dia pipe bending formers	One	1,800·00
2.	Fly Press No. 3	One	1,600·00
3.	Arc welding set 250-350-Amp.	One	4,000·00
4.	Bench type drill m/c with 1 H.P. motor and other electricals, 12 mm.	One	2,500·00
5.	Flexible Shaft Grinder	One	1,000·00
6.	Portable Drilling m/c. 6 mm cap	One	500·00
7.	Lever type Shear, blade size 150 mm	One	400·00
8.	Painting accessories	One set	200·00
			12,000·00
(b)	Electrification and installation charges @10% of cost machines		1,200·00
(c)	Cost of Tools, Dies, Fixtures etc.		400·00
(d)	Cost of Office Equipment		1,000·00
	Total cost of Machinery and Equipment		14,600·00

VII. Raw Material (per month)

		Rs.
1.	Conduit pipe 1-1/4" dia × 32 SWG 7,500 ft. @ Rs. 1/50 per ft.	11,250·00
2.	Conduit pipe 1" dia (25 mm) × 16 SWG 6,000 ft. @ Re. 1/- per ft.	6,000·00
3.	C. R. sheet 16 SWG 50 Kg.	225·00
4.	Leg shoes (rubber/plastics)	200·00
5.	Nylon Niwar for folding cots 250 kg. @ Rs. 25/- per kg.	6,250·00
6.	Self tapping screws No. 6 × 12 mm @ Rs. 4·50 per 100 Nos.	900·00
7.	Rivets, washers, paints, welding rods and other consumables	200·00
		25,025·00
	Say	25,000·00

VIII. Staff and Labour (per month)

Rs.

1. Manager-cum-Production Engineer	1	1,000.00
2. Accountant-cum-Office Assistant	1	300.00
3. Skilled workers	3	900.00
4. Unskilled workers	2	400.00
5. Chowkidar	1	200.00
		2,800.00
Perquisites @ 15%		420.00
		3,220.00
Say		3,200.00

IX. Other Expenses (per month)

Rs.

1. Rent	1,500.00
2. Power & water	100.00
3. Postage & Stationery	50.00
4. Transport	50.00
5. Insurance etc.	50.00
6. Maintenance	50.00
7. Sales expenses	100.00
	1,900.00

X. Working Capital (per month)

Rs.

1. Raw material	25,000.00
2. Staff & labour	3,200.00
3. Other expenses	1,900.00
	30,100.00
Working Capital for 3 months	90,300.00

XI. Total Capital Investment

Rs.

1. Fixed Capital	14,600.00
2. Working Capital (3 months)	90,300.00
	1,04,900.00
Say	1,05,000.00

XII. Cost of Production (per annum)

Rs.

1. Raw materials	3,00,000.00
2. Salaries	38,400.00
3. Other expenses	22,800.00
4. Interest on Capital Investment @ 15%	15,750.00
5. Depreciation on machinery @ 10%	1,460.00
	3,78,410.00
Total Say	3,78,400.00

XIII. Total Sales (per annum)

Rs.

By sale of

(a) Fixed steel cots 3000 Nos. @ Rs. 56/-	1,68,000.00
(b) Folding steel cots 3000 Nos. @ Rs. 82/-	2,46,000.00
Total	4,14,000.00

XIV. Profitability (per annum)

Total sale—Cost of Production=Profit
4,14,000—3,78,400 =Rs. 35,600.00

(a) Percentage of Profit on sale = $\frac{35,600 \times 100}{4,14,000} = 8\%$

(b) Percentage of return = $\frac{35,600 \times 100}{1,05,000} = 34\%$

XV. Break-Even Analysis

B.E.P. = $\frac{\text{Annual fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$

Fixed cost (per annum)

Rs.

1. Rent	18,000.00
2. Interest	15,750.00
3. Depreciation on machinery	1,360.00
4. 40% of salaries	15,360.00
5. 40% of other expenses	9,120.00
	59,690.00
	59,700.00

B.E.P. = $\frac{59,700 \times 100}{59,700 + 35,600} = 41\%$

Address of Machinery Suppliers

1. M/s. Manik Lal & Sons,
113/115, Narain Dhru Street,
Bombay-400003.
2. M/s. Atlas Works, (Pvt.) Ltd.
119, Ripon Street,
Calcutta.
3. M/s. D. H. Brothers,
Latuche Road,
Kanpur.
4. M/s. Perfect Machine Tools,
24E, Connaught Place,
New Delhi-110001.

(Reserved item S. No. 398)

I. (a) Product and Its Uses

Sterilizers are used for sterilizing the medical tools which are used for the purpose of operation on the body of any human being. Private Doctors and all the hospitals need this type of container for the use of tool sterilizing. There are different sizes of sterilizers.

(b) Market Potential

This product has good domestic market and also export potential. Private doctors, Govt. hospitals and private hospitals are the main consumers of this product. Government policy to provide more facilities towards medical institutions and medical services to the people is also an important factor to encourage the demand of sterilizers. This is an export-oriented item.

II. Basis, and Presumptions and Production Targets

1. The scheme has been calculated on the basis of 75% inefficiency on single shift, considering 25 days in a month.

2. The rate of interest in the scheme has been taken on the basis of 15 per cent at an average. However, this figure is likely to vary depending on the financial outlay of the project as well as location of the unit.

3. The breakeven point in the scheme has been calculated on the full capacity utilisation basis.

4. The cost of machinery and equipment items as indicated refers to a particular machine and the prices are approximate to those ruling at the time of calculation of this scheme.

5. The provisions made in other respects viz. raw material, personnel, utilities, overheads etc. are drawn on the basis of standard operations and average outputs and the cost indicated against each are approximate and based on local markets, conditions and observations.

6. All the operations will be carried out in the workshop itself.

7. All the machines are indigenously available.

8. Some of the standard components and items would be procured from the local market. The list

has been provided in the scheme under the heading of 'Bought-out component'.

9. The scheme has been based only on stainless steel.

10. Production Capacity (per annum)

Quantity	30,000 Pcs.
Value	80,85,000

III. Process Outline

1. Shearing of sheet.
2. Deep drawing, contained and tray.
3. Spot welding of rim under the lid.
4. Drilling of holes in the tray.
5. Polishing of container and lid.
6. Fitting of electrical elements, handles, hinges & legs.

IV. Outlay and Specification

The item is to be manufactured as per I.S.I specification No. 7455-1974. Sterilizers are generally made in the following sizes:

1. 18" x 6" x 6"
2. 14" x 6" x 4"
3. 24" x 8" x 8"
4. 24" x 10" x 8"
5. 20" x 8" x 6"

Financial Aspects :

1. Fixed Capital :

V. Land and Building

Land	600 sq. mt.
Covered area	250 sq. meters (Rented)

(Motive power 30 H.P.)

VI. Machinery and Equipment

Sl. No.	Description	Indigenous Imported	Qty.	Price (Rs.)
1.	Hydraulic Press 250 tons 15 HP motor	Indigenous	1	2,50,000·00
2.	Lathe machine 4 1/2" cap. 2 HP motor	Do.	1	8,000·00
3.	Drilling m/c. cap. 1 1/2", 1 1/2" HP motor	Do.	1	3,000·00
4.	Buffing/polishing m/c. 3 HP motor	Do.	2	6,000·00
5.	Spot welding machine 5 KW	Do.	1	10,000·00
				2,77,000·00

Installation and electrification charges @ 10% on the total cost of machine 27,700·00

Tools, Jigs and fixtures 5,000·00

Dies 20,000·00

Office furniture and equipment 6,000·00

3,35,700·00

2. Working Capital

VII. Raw Materials (per month)

Stainless steel for body 18 gauge @ 58/- per Kg. 3500 Kg. 2,03,000·00

Stainless steel for tray 16 gauge @ 58/- per Kg. 1250 Kg. 72,500·00

2,75,500·00

Bought-out Components

1.	Heating element (Kettle) 2 KW 2500 pcs. 68/- each	1,70,000·00
2.	Drain cock S. S., 2500 pcs. 17/50 each	43,750·00
3.	Cover lifting handle 200 pcs. 2·50 each	6,250·00
4.	Hinges S. S. 2-1/2" x 1-1/2" 2500 pairs 7/- pair each.	17,500·00
5.	Leg Bakelite with screw 2500 set Rs. 4/50 set of 4 pcs.	11,250·00
6.	Tray lifting hook S.S. 10 g. 6 set 2500 sets	15,000·00
7.	Specifications Plate alu. each 1/-	2,500·00
8.	Name plate 0050 N.P.	1,250·00
9.	Packing carton Rs. 5/- each piece	12,500·00
10.	PVC Bag for packing Re. 1/- each piece	2,500·00
11.	Packing wood wool Re. 1/- each piece	2,500·00
12.	Container handles 2 piece 10 gauge Rs. 4/- per set	10,000·00
		2,95,000·00

VIII. Personnel :

1.	Manager	1	1,000·00
2.	Clerk/typist	1	350·00
3.	Chowkidar	2	400·00

Technical, Skilled and Unskilled

1.	Skilled workers	2	800·00
2.	Skilled worker die maker	1	600·00
3.	Semi-skilled workers @ Rs. 250/- each	3	750·00
4.	Fitter (Rs. 350/-each)	2	700·00

Total (Salaries) 4,600·00
(+) Perquisites @ 15% of Salaries 690·00

Total 5,290·00
Say 5,300·00

IX. Other Expenses

(a) Utilities (per month)

1.	Power	900·00
2.	Water	100·00
		1,000·00

(b) Overhead Charges (per month)

1.	Repair & Maintenance	1,000·00
2.	Postage & stationery	500·00
3.	Telephone	1,000·00
4.	Consumable stores	500·00
5.	Advertisement	2,000·00
6.	Transport charges	2,000·00
7.	Insurance	100·00
8.	Misc. expenditure	1,000·00
		8,100·00

X. Total Working Capital (per month)

1.	Personnel	5,300·00
2.	Raw material & Bought-out components	5,70,500·00
3.	Utilities	1,000·00
4.	Overhead charges	8,100·00
5.	Rent	2,500·00
		5,87,400·00

XI. Total Capital Investment :

1.	Fixed Capital	3,35,700·00
2.	Working Capital for 2 months	11,74,800·00
		15,10,500·00

XII. Cost of Production (per year)

1. Working Capital	7,48,800·00
2. Dep. on machinery @ 10%	30,500·00
3. Dep. on tool & die @ 20%	5,000·00
4. Dep. on furniture @ 25%	1,500·00
5. Interest on investment @ 15%	2,26,000·00
	73,11,800·00

XIII. Sales Proceeds (per year)

Sterilizer 14"×6;×6/ 30,000 pcs. @ Rs. 275/- each	82,50,000·00
Sales commission @ 2%	1,65,000·00
	80,85,000·00

XIV. Profitability

Net Profit Per year	80,85,000·00
(Before income tax) (—)	73,11,800·00
	= 7,73,200·00
Net Profit Ratio	9·4%
Rate of Return	51%

XV. Breakeven Analysis :

B.E.P. $\frac{\text{Annual fixed cost} \times 100}{\text{Annual Sales} - \text{Annual variable cost}} = 31\%$

XVI. Addresses of Machinery Manufacturers

- | | |
|---|----------------------|
| 1. M/s. Indian Hydraulic Industries Pvt. Ltd.,
Najafgarh Road, New Delhi. | Hydraulic Press |
| 2. M/s. Indian Expeller Works Ltd.
Empeller No. A—4, Naroda Indl. Estate, Naroda, Ahmedabad. | Hydraulic Press |
| 3. M/s. Bikhu Engg. Corpn.
630/10 Nanta Nagar, Ludhiana-3. | Lathe |
| 4. M/s. Leading Engg. Works
Anand Parbat Indl. Area,
New Rohtak Road, New Delhi. | Lathe |
| 5. M/s. Sethi Industries,
Shadi Pur, Near West Patel Nagar
Bus Stand New Delhi. | Buffing Machine |
| 6. M/s. Jaya Fluid Sciaky Ltd.,
D1 Block, Plot No.-18/1,
Chinchwad, Poona-19. | Spot Welding Machine |
| 7. M/s. Kala Machine Tools,
No. 119, Shivaji Road, Shivaji Nagar,
Bangalore-51. | Drilling Machine |

Raw Materials Suppliers

1. Through M.M.T.C. or from open market.

(Reserved item Sl. No. 786).

(a) Product & its use

Steel Cup-board & Racks are used in Government offices, Private Companies and also in houses for keeping important documents, valuable clothes and other articles. There are several sizes of steel Cup-board & Racks but the most common sizes are as under:—

Cup board	78" × 36" × 19"
Racks—	78" × 36" × 19,

(b) Market Potential

The demand for these items is increasing day by day due to rapid development of the living standard of the people. The demand for such cup board is now not limited to cities only but getting popularity in villages also. These are marketed through whole-sale dealers of different localities. These also can be marketed through DGS&D to Government departments.

II. Production Targets (Per annum)

Sl. No.	Name of the items	Qty	Value Total
1.	Steel Cup-Board 78" × 36" × 19";	900 nos.	Rs. 6,75,000 750/-
2.	Steel Racks 78" × 36" × 19" 600 nos.		Rs. 1,50,000 250/-
			8,25,000

III. Product Details and Process of Manufacture

The details worked out for the manufacture of Cup-Board and Racks have been based on the ISI No. IS-6189-71 & IS-1883-75.

The process of manufacture is as under:—

Cup Board

Sheets are to be cut in sizes, corners are to be cut before folding the sheets for giving the desired shape. After folding the sheets, welding is done on joints. shelves are to be fitted in the body on desired height and rivetted with the body. Thereafter doors are to be fitted on the body of cup-board and then key-hole is to be made on the door. The cup-board, then is to be sent for painting. After painting, the lock, door-handles and other items are to be fitted.

Racks:

Sheets are to be cut according to the dimension of the shelf, corners for bending the sheet are to be cut on press. After straightening the sheets the border of shelves are to be folded on sheet folding brake press. Necessary holes are also to be made for fixing the same on Angle Iron Frame.

For making the angle Iron Frames for the racks, Angle Iron are to be cut on power hacksaw machine of desired length. Holes are to be made on Drill machine for making the provision for fixing the shelf at the desired height. Corners of the frame are to be welded. After assembly the racks are to be sent to the painting section.

IV. Inspection/Quality Control

1. Material should be used of Standard Quality.
2. Proper Riveting and Welding should be done.
3. Item should be cleaned and phosphated before painting.
4. Spray painting should be done properly and also baked the paint as the specification laid down in the ISI.

V. Financial Aspects

(1) Fixed Capital

- (i) Land and Building—Rented
Covered area 200 sq. meter @ 10/-
per sq. meter 2,000.00 (P.M.)

(ii) Machinery and Equipment

(a) Production Unit

Sl. No.	Description	Indigenous	Qty.	Price (Rs.)
1	Guillotine shearing machine (Tradle type) 4' × 16 SWG cap	Indigenous	1	10,000.00
2	Screw Type sheet folding brake (Manual operated) 7' × 16 SWG cap	"	1	10,000.00
3	Hand shearing m/c 15" & cutting cap. 1: SWG	"	1	1,000.00
4	Power press 10 ton cap.	"	1	10,000.00

1	2	3	4	5
5. Gas Welding set with welding torch	Indigenous	1	2,000.00	
6. Electric welding set 220 amp. 440 volts (5 KVA)	"	1	3,000.00	
7. Bench Drilling m/c 1/2" capl (1/2 H.P.)	"	1	2,500.00	
8. Portable drilling m/c 1/2" cap. (1/4 H.P.)	"	1	1,500.00	
9. Flexible shaft grinder 6" wheel (1/4 H.P.)	"	1	1,000.00	
10. Power Hacksaw m/c 6"x6" cap.	"	1	3,000.00	
11. Compressor with Spray Gun	"	1	3,000.00	
12. Cleaning Tanks M.S. 8'x4'x4'	"	1	6,000.00	
13. Cleaning tanks with rubber lining 8'x4'x4'	"	1	4,000.00	
14. Baking oven 8'x6'x6' electrically operated (10 KVA)	"	1	10,000.00	
			67,000.00	
(b) Testing Equipment :				
Measuring instruments such as wire gauges, V. Caliper etc.				1,000.00
(c) Electrification & Installation charges @ 10% of cost of m/c & equipment				
			6,500.00	
			74,500.00	
(iii) Cost of fixtures/dies				
			3,000.00	
(iv) Cost of office equipment & furniture				
			5,000.00	
(v) Pre-operative expenses				
			2,000.00	
			84,500.00	

2. Working Capital (per month)

(i) Personnel

Designation	No.	Salary	Total (Rs.)
(Administrative & Supervisory)			
1. Manager	1	1000	1,000.00
2 Accountant-cum-Store-keeper	1	500	500.00
3. Clerk-cum-Typist	1	300	300.00
4. Peon/Chowkidar	3	200	600.00
Technical-Skilled & Unskilled			
5. Foreman	1	800	800.00
6. Skilled Workers		400	1,200.00
7. Semi-skilled worker	3	300	900.00
8. Helpers	2	200	400.00
Total (Salaries)			5,700.00
(ii) Perquisites @ 15% of salaries			850.00
Total			6,550.00

(ii) Raw material including Packing requirements (per month)

Particulars	Indige- nous/ Imported	Qty.	Rate Rs.	Value Rs.
1. CR/B.P. sheet (20, 18 & 16) SWG	Indige- nous	8 M. tons.	4,200 per M. ton	33,600.00
2. Angle Iron 35x35x6mm	"	1 M.	3,000 per M. ton	3,000.00
3. M./S. Plate 3mm Thick	"	250 kg.	Rs. 4/- per kg.	1,000.00
4. Paints	"	50 litre	Rs. 25 per lit.	1,250.00
5. Welding material	"	—	—	500.00
				39,350.00

Bought out components

1. Nuts, Bolts, Screws Rivets, etc.			250.00
2. Cup board fitting Ind. (Hings, locks etc)	75 sets	Rs. 25.00 per set	1,875.00
Total			41,475.00

iii) Utilities

Power		450.00
Water		50.00
		500.00

(iv) Other contingent expenses (per month)

1. Rent		2,000.00
2. Postage & Stationery		100.00
3. Telephone		250.00
4. Consumable stores		250.00
5. Repairs and Maintenance & Dies		500.00
6. Transport charges		750.00
7. Advertisement		250.00
8. Insurance		100.00
9. Taxes		100.00
10. Sales expenses		1,750.00
Total		6,050.00

(v) Total recurring expenditure (P.M.) 54,575.00

(vi) Total working capital (on 3 months basis) 1,63,725.00

3. Total Capital Investment

(i) Fixed Capital	84,500.00
(ii) Working capital for 3 months	1,63,725.00
	2,48,225.00

Cost of Production per year

1. Total recurring cost per year	6,54,900.00
2. Depreciation on machinery & equipment @ 10%	6,700.00
3. Depreciation on Dies & Fixtures @25%	750.00
4. Depreciation on measuring instruments @20%	200.00
5. Depreciation on office equipment @15%	750.00
6. Interest on total investment @15%	37,200.00
	<u>7,00,500.00</u>

2. Turn over (per year)

Item	Qty.	Rate Rs.	Value Rs.
1. Cup Board	900	750/-	6,75,000.00
2. Steel racks	600	250/-	1,50,000.00
			<u>8,25,000.00</u>
63. Net profit per year (5—4)			<u>18,25,000.00</u>
			<u>7,00,500.00</u>
			<u>1,24,500.00</u>
7. Net profit ratio			15%
8. Rate of return			50%
9. Break even point			48%

10. Address of Machinery Suppliers

1. M/s. J.B. Advani Oarlikon
Ashoka Estate,
Barakhamba Road, New Delhi.
2. M/s Malik Electric Works
13 Victoria Road, Low Level
Bombay-10 DD.
3. M/s. Tajindra Elect. Works
42 G.B. Road, Delhi.
4. M/s. Indian Oxygen.
Najafgarh Road, New Delhi.

Elect. Weld-
ing set &
Gas Welding
set

5. M/s. Mahalakshmi Engg. Works
26 DLF Indl. Area, New Delhi.

Bench Dri-
lling m/c

6. M/s. Kala Machine Tools
119 Shivaji Road,
Shivaji Nagar, Bombay-51.

7. M/s. Moti Ram & Sons.
Sarda Nand Marg, Delhi-6.

Rivetting
portable
drilling m/c.
Flexible shaft
Grinder
(Wolf) Dou-
ble ended
Grinder.

8. M/s. H.M. Dowel & Sons.
Sarda Nand Marg, Delhi-6.

9. M/s. United Machine Co.,
B-96 Mayapuri Indl. Area,
New Delhi.

Power Press

10. M/s. Manko Industries
Indl. Area, Ludhiana.

11. M/s. K.G. Khosla & Co.,
Mathura Road, Faridabad.

Compressor
with Gun

12. M/s. Manjeet Engg. Works,
71/1 Najafgarh Road, Delhi.

13. M/s. Simplicity 'Engg. Works
B-99 Mayapuri Indl. Area,
Phase I, New Delhi.

Baking oven

14. M/s. Narang Scientific Works
Indl. Area, Naraina.
Phase II, New Delhi.

15. M/s. Pathick Engg. Works,
A-41 Indl. Area,
Mayapuri, New Delhi.

Cleaning
tanks

16. M/s Bright Metal Industries,
A-K-13 Araksha Road,
Paharganj, New Delhi.

Raw material

Can be procured from the local market.

(Reserved items S. Nos. 399, 400).

I. The Product and Its Uses

(a) Steel Trunks are widely used as house-hold articles. For the convenience of transport and storage, steel trunks are more reliable and cheaper in comparison to other packing devices. For this reason this is the most popular packing device. The colour and designs are made according to the taste of different classes.

(b) Market Potential

The item has got popular demand and with economic growth people are becoming mobile more and more. Moreover with economic growth, poorer classes also are having more belongings in comparison to earlier days. Since this class depend mostly on trunks for storage of their cloths and costly items, necessity of having at least one or two trunks are essential. Keeping these points in view, it may be safely stated that steel trunks have very good market potential and it is sure to improve every day.

II. Production Target

In this scheme, it is targeted to produce 6000 boxes per annum. The varieties of size and designs will be dependent on the type of market to be catered to. These things will have to be decided according to the different regions and localities and the population whose demand are to be met.

III. Production Details and Process of Manufacture

The sheets are to be cut to size. Then those are to be bent to form and ends are to be folded. The sheets for the different walls are fitted together by means of rivetting. To keep the cost of investment as low as possible, it is better to use non-power machines. The trunks are then pointed and designs etc. drawn for consumer preference.

IV. Quality Control and Standard

Since main attraction for this product is strength and durability in comparison to other packaging devices, it is essential to pay particular attention to the different raw materials and components. Steel sheets used for manufacture must be free from rust and polished carefully so that there may not be any scope of rust formation prior to painting. Rivets and other fitments are also to be inspected thoroughly before fitting. Since trunks are required for safety and security locking devices are to be carefully selected and the necessary safety is ensured.

V. Land and Building

Covered Area 100 sq. meter-rented

Rs. 500 p.m.

VI. Machinery and Equipment :

		Rs.
1. Treadle Guillotine shearing machine 24" size	1 No.	1,550.00
2. Universal swaging and beading machine	1 No.	850.00
3. Trunk Folding Machine	1 No.	2,500.00
4. Sheet Metal tools		500.00
5. Installation		200.00
6. Furniture		1,500.00
		7,100.00

VII. Raw Material Requirements (per month)

1. Mild steel sheet 18 to 20 SWG 2 ton @ Rs. 4000 per ton	Rs. 8,000.00
2. Fittings	1,000.00
3. Rivets etc.	200.00
4. Paints	100.00
	9,300.00

VIII. Staff and Labour (per month)

		Rs.
1. Supervisor	1 No.	500.00
2. Skilled workers @Rs. 250	4 Nos.	1,000.00
3. Unskilled workers @Rs. 200	2 Nos.	400.00
		1,900.00

IX. Other Expenses (per month)

	Rs.
1. Rent	500.00
2. Electricity & water	20.00
3. Cartage & freight	50.00
4. Publicity & sales expenses	100.00
5. Stationery & postage etc.	30.00
	700.00

X. Working Capital Required (per month)

	Rs.
1. Raw Material	9,300.00
2. Staff and labour	1,900.00
3. Other expenses	700.00
	11,900.00
	12,000.00

Say Rs.

XI. Total Capital Investment

	Rs.
1. Machinery & equipment . . .	7,100·00
2. Working capital for 3 months .	36,000·00
Say . . .	43,000·00

XII. Cost of Production (per annum)

	RI
1. Raw Material (9300×12) . . .	1,11,600·00
2. Salaries (1900×12) . . .	32,800·00
3. Other expenses (700×12) . . .	8,400·00
4. Interest on capital @ 15% . . .	6,450·00
5. Depreciation on machinery @10% . . .	710·00
	1,59,960·00
Say . . .	1,60,000·00

XIII. Total Sale (per annum)

	Rs
By sale of 6000 boxes at an average rate of Rs. 29·00 . . .	1,74,000·00

XIV. Profitability (per annum)

Total sale—cost of Production	=Profit
Rs. 1,74,000—1,60,000	=Rs. 14,000
(a) Percentage of Profit on sale	$= \frac{14000}{174000} \times 100 = 8\%$
(b) Percentage of return over investment	$= \frac{14000}{43000} \times 100 = 32\%$

XV. Break even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed cost} \times 100}{(\text{Fixed cost} + \text{Profit})}$$

Fixed cost (per annum)

1. Rent . . .	6,000·00
2. Interest . . .	6,450·00
3. Depreciation on M/c. and equipments . . .	710·00
4. Supervisor's salaries . . .	6,000·00
5. 40% of other expenses . . .	960·00
	20,120·00

$$\text{B.E.P.} = \frac{20120 \times 100}{(20120 + 14000)} = 58\%$$

XVI. Addresses of Machinery Supplier

1. M/s. Batliboi & Co. (P) Ltd.,
26 R. N. Mukherjee Road,
Calcutta.
2. M/s. Industrial Tools, Syndicate,
78/39 Netaji Subhas Road,
P.B. No. 11007,
Bombay-20
3. M/s. Maneklal & Sons,
119, Narayan Dhuru Street,
Bombay.
4. M/s. Batliboi & Co. (P) Ltd.
98-A Armenian Street,
Madras.

(Reserved item Sl. No. 368)

STOP LAMP ASSEMBLY—AUTO

I. Product and Its Use

Auto lamps are one of the most important items in the vehicle. No vehicles are manufactured without the auto lamps. These lamps are used for stopping and brake signal and are fitted in the back side of the vehicle.

II. Market Potential

Auto lamps require replacement when it is absolutely unserviceable since no risk can be taken as it may involve risk of human life during driving the automobile. Every year the production of automobiles are increasing and as such the auto lamps are also being used in each vehicle. So there is a good market for this item.

III. Production Target

It is proposed to manufacture 1250 pcs. of stop lamp per month. For the purpose of calculation the lamps for Ambassador car has been taken into consideration. The shape, size and design changes according to the type of vehicle.

IV. Product Details and Process of Manufacture

The entire Auto lamp assembly consists of the various components viz. Reflector, metal ring riveted with holder, rubber connector, transparent plastic cover, wire terminals, Bakelite spacers, springs and screw & nut. Reflector and metal ring is a sheet metal component and is processed by pressing operation in press machine followed by metal treatment for perfect illumination. Other parts like rubber, bakelite and plastic cover are bought out components which are assembled with galvanised screw and washer. Each lamp assembly first packed with polythene packet and then in the printed card board box.

V. Inspection and Quality Control

Auto lamps are generally manufactured with the drawings and design of parent vehicle industry. Care should be taken in all steps for its interchangeability. Plating takes a vital role for the better reflection. So it is advisable to get the plated components tested from recognised test houses.

V. Land and Building

Covered area 60 sq. meter—Rented 150·00
(P. M.)

VII. Machinery and Equipment :

1. Geared hand lever shearing m/c cap. 16 SWG	1 No.	950·00
2. 30 tons power press with 5 H.P. motor & accessories.	1 No.	12,500·00
3. Double arm bell press No. 12	1 No.	2,50·00
4. Bench drill with 1½ H.P. motor	1 No.	850·00
5. Tppig machine with 1/2 H.P. motor	1 No.	3,400·00
6. Dies and punches	L.S.	4,000·00
7. Hand tools, measuring instrument	L.S.	2,000·00
		26,200·00
8. Installation & Electrification	L.S.	2,800·00
9. Furniture & fixture including office equipment		2,000·00
		3,000·00

VIII. Raw Material (per month)

1. C.R.C. sheet 30 gauges & 22 gauges	1 ton	5,000·00
2. Rubber connector (bought out item)	1250	2,500·00
3. Plastic cover Red & Yellow (bought out item)	1250	1,250·00
4. Wire, galvanised screw & nuts, bakelite, springs etc.	L.S.	1,250·00
		10,000·00

IX. Staff and labour (per month)

		Rs.
1. Manager	1 No.	600·00
2. Supervisor	1 No.	400·00
3. Skilled operator	2 Nos.	600·00
4. Unskilled labour	3 Nos.	600·00
5. Watchman cum peon	1 No.	200·00
		2,400·00
Cost of labour benefit @ 10 %		240·00
		2,640·00

X. Other Expenses per month

Rs.

1. Rent	150.00
2. Electricity	200.00
3. Consumable tools, oil, lubricants and other consumable tools	100.00
4. Galvanising & plating charges	1,000.00
5. Carriage & freight	100.00
6. Packing cost	600.00
7. Publicity	100.00
8. Sales expenses including travelling	100.00
9. Stationery & other machine expenses	100.00
	<u>2,450.00</u>

XI. Working Capital Required (per month)

1. Raw material	10,000.00
2. Staff & labour	2,640.00
3. Other expenses	2,450.00
	<u>15,090.00</u>
Say	15,000.00

XII. Total Capital Investment

1. Machinery & equipment	31,000.00
2. Working capital for 3 months	45,000.00
	<u>76,000.00</u>

XIII. Cost of Production (per annum)

1. Raw material	1,08,000.00
2. Staff & Labour	31,680.00
3. Other expenses	29,400.00
4. Interest on capital @ 15%	11,400.00
5. Depreciation on m/c. @ 10%	3,100.00
	<u>1,83,580.00</u>

XIV. Total Sale (per annum)

By Sale of 15,000 nos. Stop lamp Rs. 11.00 each	1,95,000.00
By sale of recoverable scrap	10,000.00
	<u>2,05,000.00</u>

XV. Profitability

Total sale	Cost of production	Profit
2,05,000	1,83,580	21,420
(a) Percentage of profit = $\frac{21,420 \times 100}{2,05,000}$		= 6% approx.
(b) Percentage of profit = $\frac{21,420 \times 100}{76,000}$		= 29%

XVI. Break-even analysis

B.E.P.	$\frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{Profit}}$
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Fixed cost (per annum)

Rs.

1. Rent	1,800.00
2. Interest	11,400.00
3. Depreciation on m/c. & equipment	3,100.00
4. 40% salary	12,800.00
5. 40% other expenses (excluding rent)	11,320.00
	<u>40,420.00</u>

B.E.P.	$\frac{40,420 \times 100}{61,880} = 64\%$
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XVII. Name and Address of Machinery Supplier

- 1 M/s. Power Tools & Appliances Co.,
123, Mount Row, Madras-6.
- 2 M/s. Atlas Works (P) Ltd.,
119, Rippon St., Calcutta-16.
- 3 M/s. Kala Machine Tools,
119, Shivaji Nagar, Bangalore-57.

(Reserved item Sl. No. 645).

I. The Product And Its Uses

Steel Measuring Tapes are used for measuring length or distances. These are handy items being encased in rolled form. They may be transported from place to place in pocket or small bags. They have long life. For the sturdiness and easy handling in outdoor activities such as in construction sites or sports fields, executives prefer to have this article in their pockets. The item has been reserved for production in small scale only.

The tapes have got the following components:

- (1) Measuring strip
- (2) Spring coil strip
- (3) Base for coil
- (4) Cover for coil
- (5) Casing top
- (6) Casing bottom
- (7) Fixing screw.

II. Market Potential

There is good demand for this product in the market. There are very few units in this line. As such already there is a gap between demand and supply. In view of increasing activities in construction, sports and games etc., this gap will go on increasing. So, there is sufficient scope for new units in small scale in various parts of the country.

III. Production Target

There are various sizes of steel tapes ranging from 50 ft. to 100 ft. The most popular size, however is 50 ft. For the convenience of calculation and anticipated trend of entrepreneurs selecting this size initially, the profile has been estimated on this size only anticipating an output of 24000 Tapes annually. In view of high cost of imported marking machine the Break Even Point of the plant is very high which is 100 per cent.

IV. Production Details and Process of Manufacture

The raw materials are expected to be available locally. However, there may be some difficulties of getting the spring steel strips from local suppliers.

In that case import may be made on the basis of no objection certificate from M/s. Hindustan Steel Ltd.

In the process of manufacture, the cases are pressed out of sheets and fixing arrangements are to be purchased from other units. Steel strips are to be marked by scale marking machine. The machine in this scheme is selected for capacity upto 1200 mm although the scheme estimates are based for 600 mm. The unit can be started in a built up factory shed of about 80 square metres.

V. Quality Control and Standard

There is no Indian Standard Specification available on this item. In view of the importance of the product as regards accuracy of measurement, strict control in cent per cent checking is essential. Since this is to cater to discriminating clientele, side by side to accuracy, consumer appeal should also be achieved by attractive finish.

VI. Land and Building

	Rs.
100 sq. metres covered area to be rented @Rs. 5/- per sq. metre per month	500.00

VII. Machinery and Equipment

1. Inclinal Power Press 20 Tonnes Capacity—2 nos.	30,000.00
2. Abrasive cutting machine—1 no.	3,000.00
3. Spring coiling machine—2 nos.	5,000.00
4. Rivetting machine—1 no.	4,000.00
5. Hand operated Linear Dividing M/c. for Scale Marking—table size—1260 x 175 mm with additional accessories— 1 no.	2,57,000.00
6. Stamping Machine (Eccentric Press)	2,000.00
7. Work Bench, Vise, hand tolls etc.	5,000.00
8. Dies and tools	6,000.00
9. Testing Instrument	12,000.00
10. Towards installation erection etc.	30,000.00
11. Towards furnitures & fixtures	6,000.00
	3,60,000.00

VIII. Salaries and Wages per month

	Rs.
1. Manager-cum-Engineer @ Rs. 1,000/-	1,000·00
2. Office Assistant-cum-Storekeeper @ Rs. 500/-	500·00
3. Inspector @ Rs. 600/-	600·00
4. Chargehand-cum-Mistry @ Rs. 500/-	500·00
5. Machine Operators @ Rs. 400/- (3 nos)	1,200·00
6. Apprentices @ Rs. 150/- (4 nos.)	600·00
7. Watchman-cum-Peon @ Rs. 200/- (2 nos)	400·00
8. Labour amenities	700·00
	<u>5,500·00</u>

IX. Raw Materials (per month)

	Rs.
1. Cold rolled strip 30 S.W.G.—700 kg. @Rs. 4,000/- per metric tonne	2,800·00
2. Tin Plate 28 S.W.G.—500 kg. @ Rs. 6,000/- per metric tonne	3,000·00
3. Spring strip & Wire—400 kg. @ Rs. 6,000/- per metric tonne	2,400·00
4. M. S. strip 200 kg. @ Rs. 3,500/- per m.t.	700·00
5. Snap fasteners 1000 gross @ Rs. 2/- per gross	2,000·00
6. Printing ink 50 kg. @ Rs. 6/- per kg.	300·00
7. Sundries	300·00
	<u>10,500·00</u>

X. Other Expenses per month

	Rs.
1. Rent	500·00
2. Power and electricity	300·00
3. Consumable items	100·00
4. Transport & Conveyance	200·00
5. Contingencies	200·00
	<u>1,300·00</u>

XI. Working capital (3 month's recurring expenses)

	Rs.
1. Salaries and wages	16,500·00
2. Raw Materials	31,500·00
3. Other Expenses	3,900·00
	<u>51,900·00</u>

XII. Capital Investment

	Rs.
1. Fixed	3,60,000·00
2. Working	51,900·00
	<u>4,11,900·00</u>

XIII. Cost of Production (Annual)

	Rs.
1. Manufacturing cost	2,07,600·00
2. Depreciation of M/c. @ 10%p.a.	36,000·00
3. Interest on capital @ 15% p.a.	61,785·00
4. Marketing expenses 10% of sales	43,200·00
	<u>3,48,585·00</u>
Say Rs.	<u>3,48,600·00</u>

XIV. Sales Proceeds (Annual)

By sales of 24,000 steel tapes @ Rs. 18/- each 4,32,000·00

XV. Profitability before taxes

Profit = XIV—XIII = Rs. 4,32,000—Rs. 3,48,600 = Rs. 83,400
The profit is 19·3% of sales and 20·2% of capital investment.

XVI. Break Even Analysis

	Rs.
A. Fixed cost	
1. Depreciation of machinery	36,000·00
2. Interest on capital investment	61,785·00
3. Rent	6,000·00
4. 40% of salaries and wages	26,400·00
5. 40% of other expenses including marketing expenses	2,11,200·00
	<u>3,41,385·00</u>
	<u>3,41,400·00</u>

B. Net Fixed cost

$$\text{B.E.P.} = \frac{\text{Net Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$$

$$= \frac{341400}{341400 + 83400} = 80\%$$

XVII. Sources of Machines**A. Linear dividing Machine**

1. Garlick Engineering,
Garlick House, 414 Senapati Bapat Marg, Lower Parel, Bombay-400023.

B. Other Machines

1. International Machine Tools Corpn.
5, Bank Street P.O. Box 799,
Behind State Bank, Fort,
Bombay-400023.

2. Machine Tools Impex,
75, Ganesh Ch. Avenue,
Calcutta-700013.

3. Ashok Brothers, 37 Panchkuin Road,
New Delhi-110001.

C. Sources of Raw Materials (Steel Items)

1. Hindustan Steel Ltd.,
Sales Offices at Calcutta, Bombay, Delhi, Madras.

2. Ahmedabad Advance Mills Ltd.,
Metals Division, Station Road,
Navsari-396445.

3. Anil Steel & Industries Ltd.,
P.B. No. 174, Jaipur-302001.

(Reserved item Sl. No. 498)

I. Product And Its Uses

(a) As it goes with the nomenclature the bins are used for storing anything from grains to commercial products both in houses and shops. The storing in steel bins supersedes the traditional methods of storing in gunny bags, underground pits, mud pots etc. which causes wastage, damage due to pests, spoils due to see page of water.

(b) Market Potntial

Since the method of storing grains is gaining momentum both in rural and urban areas, the demand of steel storage bins is increasing.

This is a light sheet metal fabrication industry and is a labour oriented line of production. Though the scheme is to manufacture storage bins, but the machinery and equipment can be easily diversified to manufacture other type of articles as trunks, ice boxes, room cooler bodies etc.

II Production Target

It is proposed to manufacture 3,000 Nos. of bins per annum.

III. Production Details and Manufacturing Process

The operations involved in the manufacturing are given as under :

- (1) Cutting of sheet.
- (2) Cutting of circ'e.
- (3) Rolling of sheet to cylindrical shape.
- (4) Seaming of the ends.
- (5) Fixing of circular base.
- (6) Fixing of lid.
- (7) Fixing of ring to the bottom.
- (8) Rivetting of handles and latch.

IV. Inspection and Quality Control

It is required to check the gauge (thickness) of the sheet. Overall dimensions are to be checked and the joint should be properly made and finished.

V. Land and Building.;

Covered area 100 sq. metres (rented). Rs. 1,000.00

VI. Machinery & Equipment :

Sl. No.	Name of the machine	Qty.	Value
1	2	3	4
			Rs.
1.	Treadle operated Guillotine Shear-ing machine	One	4,000.00
2.	Circle cutting machine—hand opera-ted	One	3,000.00

1	2	3	4
3.	Side seaming machne (hand opera-ted)	One	2,000.00
4.	Bending Roller (hand operated) 48" width	One	1,600.00
5.	Pneumatic Drill with 1/2" Drill Chuck	One	1,600.00
6.	Punching machine (hand operated)	One	500.00
7.	Double body Fly Press No. 8		3,000.00
8.	Tools, Jigs and fixtures		2,000.00
9.	Electrical fittings etc.		800.00
10.	Erection, furniture etc.		1,500.00
	Total cost of Machinery & Eqpt.		20,000.00

VII. Raw Material (per annum)

	Rs.
1. M.S. sheet 22 to 24 SWG 5 M.T.@ Rs. 4600/-	23,000.00
2. G.P. sheet 22 to 24 SWG 5 M.T. @Rs. 6000/-	30,000.00
3. M.S. strip 18 to 20 SWG 1 M.T. @ Rs. 3000/-	3,000.00
4. Handles, latches, rivets, paints etc.	9,000.00
	65,000.00
Raw Material per month	5,416.00
Say	Rs. 5,500.00

VIII. Staff & Labour (per month)

	Rs.
1. Manager-cum-Production Engr.	1 700.00
2. Supervisor	1 400.00
3. Press Operators	2 600.00
4. Skilled Workers	2 500.00
5. Semi-skilled workers	2 400.00
6. Clerk-cum-Accountant	1 300.00
7. Watchman	1 200.00
	3,100.00

IX. Other Expenses (per month)

1. Rent.	1,000.00
2. Power and Water	100.00
3. Packing and forwarding	300.00
4. Repairs and replacement of tools	100.00
5. Insurance and taxes	50.00
6. Miscellaneous	100.00
7. Stationery etc.	50.00
	1,700.00

X. Working Capital for 3 months*(based on single shift basis)*

	Rs.
1. Raw Material	Rs. 5,500 × 3 16,500·00
2. Staff and Labour	Rs. 3,100 × 3 9,300·00
3. Other expenses	Rs. 1700 × 3 5,100·00
	30,900·00
Say Rs.	31,000·00

XI. Total Capital Investment :

	Rs.
1. Machinery & Equipment	20,000·00
2. Working Capital (3 Months)	31,000·00
Total	51,000·00

XII. Cost of Production (per annum)

	Rs.
1. Raw Materials	66,000·00
2. Salaries and Wages	37,200·00
3. Other expenses	20,400·00
4. Interest on Capital Investment @ 15%	7,650·00
5. Depreciation on Machinery & Equipment @ 10% per annum	2,000·00
Total	1,33,250·00
Say Rs.	1,33,200·00

XIII. Total Sales (per annum)

By sale of 3,000 bins @ Rs. 60/-	1,80,0
less commission 15%	(—) 24,000·00
	1,56,000·00

XIV. Profitability (per annum)

Total sale—Cost of Production = Profit
 1,56,000·00 — 1,33,200·00 = Rs. 22,800

(a) Percentage of Profit on sale

$$= \frac{22,800 \times 100}{1,56,000} = 15\%$$

(b) Percentage of return

$$= \frac{22,800 \times 100}{51,000} = 45\%$$

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{(\text{Fixed cost} + \text{Profit})}$$

Fixed cost (per annum)

	Rs.
1. Rent	12,000·00
2. Interest	7,650·00
3. Depreciation on machinery	2,000·00
4. 40% of salaries	14,880·00
5. 40% of other expenses	8,160·00
	44,690·00
Say Rs.	44,700·00

$$\text{B.E.P.} = \frac{44,700 \times 100}{44,700 + 22,800} = 66\%$$

Addresses of Machinery & Equipment Suppliers :

1. M/s. Machine Tools Traders,
P.B. No. 1260,
57-A. Linghi Chetty Street,
MADRAS-600001.
2. M/s. Engineering Tools & Equipment,
P.B. No. 1972,
64, S.B. Singh Road, Fort,
BOMBAY-400023.
3. M/s. Maneklal & Sons,
115/116, Narayan Shun Street,
Barbai Moalla, Mandir,
BOMBAY-400001.
4. M/s. Jayems Engineering Co.,
R.P. Road, SECUNDERABAD.

Addresses of Raw Material Suppliers :

1. M/s. Hindustan Steel Limited,
1-7-69/5, Sarojini Devi Road,
SECUNDERABAD-3.
2. M/s. Seeweld Tubes Co.,
138/140, Narayan Dhuru Street,
BOMBAY-400003.
3. M/s. Techno Fab Industries,
P.B. No. 7518, Goregaon East,
BOMBAY-400062.
4. M/s. Deluxe Pipe Manufacturing Co.,
Cooper Smith Street,
BPT Plot No. 345/9, Dockyard Road,
BOMBAY-400010.

(Reserved item Sl. No. 408).

I. Product and Its Use

In hospitals and health centres various types of tables are needed. For example, to name a few, adjustable bed side tables, instrument tables, overbed table, obstetric labour table, operation tables etc. are required by almost all hospitals. Some of these are very simple in construction and some have a good number of components. However, these are quite suitable for manufacture in small scale industry. The items has been reserved exclusively for the manufacture in the small scale sector.

II. Market Potential

Budgetary efforts by Government has a leaning towards rural development and day by day health centres and hospitals are increasing in different areas of the country. In view of the reservation and facilities of the Government Stores Purchase Programme, the small scale units in this field will not require much effort in marketing. But for competing successfully the manufacturing units will have to be cost and Quality conscious.

III. Production Target

The estimates of this profile is based on production of 1200 nos. of Tables per annum. The break up is as follows:

1. Operation Table	60 nos.
2. Examination Table	300 "
3. Obstetric Labour Table	180 "
4. Overbed Table	240 "
5. Adjustable Instrument Table W	60 "
6. Adjustable Bedside Table	180 "
7. Ward Bedside Locker	180 "
	1200 nos.

IV. Production Details and Methods of Manufacture

The manufacture of this item is carried out mainly with m.s. tubes and sheets. The sheets are cut to size, the corners notched and the edges folded in respective sheet metal machines. The tubes are bent around "formers" grooved according to the diameters

of different sizes of tubes. The tubes are filled with a resinous material which supports the tube walls and helps in avoiding distortion during bending.

The components are assembled and welded wherever necessary. The tables are to be pickled with meticulous care to remove and prevent rust formation. Then the tables are exposed to heat to a controlled temperature according to the advise of the Paint Supplies. Then the paints are applied and tables dried properly prior to packing.

V. Quality Control and Standard

The following Indian Standard Specifications will provide guidance in purchase, production and testing of the products:

1. IS : 3498—Metal Tables
2. IS : 4033—General requirements for hospital furniture
3. IS : 4494—Overbed Tables

VI. Land and Building

	Rs.
100 square metres of covered area is to be rented @ Rs. 5/- per S.M. per month.	500.00

VII. Machinery and Equipment

1. Treadle Guillotine Shearing machine—1200 mm capa.	5,000.00
2. Hand operated Notching machine—Table size 300 mm × 450 mm	1,400.00
3. Hand operated CMT type Folding machine capacity 14 S.W.G. × 1800 mm	15,000.00
4. Arc Welding Transformer ampere range 35 to 300	5,000.00
5. Hand operated hydraulic tube bending machines—12 mm to 50 mm capa.—2 Nos.	5,200.00
6. Bench Drill M/c—12 mm capa.	2,400.00
7. Portable Spraying machine	2,000.00
8. Stoving chamber 8' × 4' × 4'	10,000.00
9. Pickling Tank (lead lined)	4,000.00
10. Work Bench, Hand Tools, Fixtures	3,000.00
11. Furnitures, Office Equipment	3,000.00
12. Erection, electrification	4,000.00
	60,000.00

VIII. Salaries And Wages (Per Month)	Rs.
1. Manager.	1,000·00
2. Skilled workers—3 nos.	1,200·00
3. Semi-skilled workers—4 nos.	1,000·00
4. Unskilled workers—4 nos.	800·00
5. Clerk-cum-storekeeper	600·00
6. Peon-cum-Watchman —2 nos.	400·00
7. Labour amenities	600·00
	<u>5,600·00</u>

IX. Raw Materials (Per Month)	Rs.
1. M.S. Sheets 1 M.T. @ 3200/- per M.T.	3,200·00
2. M.S. Rods and other sections 1/4 M.T. @ Rs. 2600.	650·00
3. Screws, castors etc.	500·00
4. M. S. tubes of various sizes @ Rs. 5/- per metre average—800 meters	4,000·00
5. Paint	750·00
	<u>9,100·00</u>

X. Other Expenses (Per Month)	Rs.
1. Rent	500·00
2. Power	200·00
3. Maintenance and replacement of small tools	300·00
4. Transport, packing forwarding	500·00
5. Contingencies	200·00
	<u>1,700·00</u>

XI. Working Capital (3 Month's recurring expenses)	Rs.
1. Salaries and wages	16,800·00
2. Raw Materials	27,300·00
3. Other expenses	5,100·00
	<u>49,200·00</u>

XII. Capital Investment	Rs.
1. Fixed	60,000·00
2. Working	50400
	<u>1,10,400·00</u>

XIII. Cost of production (Annual)	Rs.
1. Salaries and wages	67,200·00
2. Raw Materials	1,09,200·00
3. Other expenses	20,400·00
4. Depreciation of machinery @ 10% per annum	6,000·00
5. Interest on Capital Investment @ 15% per annum	16,560·00
	<u>2,19,360·00</u>

XIV. Sales Proceeds (Annual)	Rs.
1. Operation Table 60 nos. @ Rs. 5·30 each	31,800·00
2. Examination Table 300 nos. @ Rs. 380 each	1,14,000·00
3. Obstetric Labour Table 180 nos. @ Rs. 225 each	40,500·00
4. Overbed Table 240 nos. @ 100 each	24,000·00
5. Adj. Instrument Table 60 nos. @ Rs. 120 each	7,200·00
6. Adj. Bedsides Table 180 nos. @ Rs. 100 each	18,000·00
7. Ward Bedsides Locker 180 nos. @ Rs. 100 each	18,000·00
	<u>2,53,500·00</u>

XV. Profitability (Before Charging Taxes)	Rs.
Profit = XIV — XIII = Rs. (253500—219300)	
	=Rs. 34,200

The profit is 13·5% of Sales and 30% of Capital Investment

XVI. Break Even Analysis	Rs.
Fixed Cost	
1. Depreciation of machinery	6,000·00
2. Interest on Capital Investment	17,100·00
3. Rent	6,000·00
4. 40% of Salaries and wages	26,880·00
5. 40% of other expenses	5,760·00
	<u>61,740·00</u>

$$\text{Break Even Point} = \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}}$$

$$= \frac{61740 \times 100}{61740 + 34200}$$

$$= 64\%$$

XVII. Sources of Machines
1. International Machine Tools Corporation, 5, Bank Street, Behind State Bank, Fort, Bombay-400 023.
2. Maneklal & Sons, 23, Ganesh Chandra Avenue, Calcutta-700 013.
3. Ashok Bros., 37, Panchkuin Road, New Delhi-110 001.

©(Reserved item SI. No. 403)

I. Product And Its Uses

Steel furnitures of different designs are replacing wooden furnitures due to neater appearance and durability. Steel Tables are extensively used in offices, commercial establishments and hospitals. In addition, manufacturing scope in batches provide advantage as regards to cost of production. For dispersal of industries in rural areas it is preferable to have small scale units in different regions for catering to demand of hospital, school and domestic requirements. With low capital investment, if only steel tables or identical items are produced in rural industries it is possible to expand the activities gradually.

II. Market Potential

The number of educational institutions and hospitals are increasing day by day. This is creating good scope of marketing for steel furniture units. Through government store purchase programme also, many units can work satisfactorily. With the economic growth demand will increase in progression. Quality of output, however, is required to be upto the mark to cater to this sort of demand.

III. Production Target

In this profile, calculations are based on 150 tables per month.

IV. Production Detail and Process of Manufacture

Light furniture used in offices, homes and hospitals are made from light steel sheets and tubular steel. The sheets are cut to size in Guillotine Shearing machine, the corners notched and edges folded, in respective sheet metal machines. Then the components are assembled, wherever necessary, by welding. The welded surfaces are polished and cleaned, thoroughly.

Tubings are bent around "former" grooved to the diameter of the tubes. The tubes are filled with a resinous material which supports the tube walls and helps in avoiding distortion during bending.

The furnitures are to be pickled properly prior to painting. In rural units or in very tiny units stove heating prior to painting is avoided but for quality production these operations are needed.

V. Quality Control and Standard

The following Indian Standard Specifications will provide guidance in purchase, production and testing of the products:

- | | |
|-------------------|---|
| 1. IS : 3498-1966 | —Metal Tables |
| 2. IS : 3663-1966 | —Dimensions of Tables and Chairs in General Office Purposes |
| 3. IS : 4494-1968 | —Tables, Overbed |
| 4. IS : 4033-1967 | —General Requirements For Hospital Furniture. |

For consumer appeal and attractive appearance painting should be fast and durable. At the same time rust formation must be avoided or cleaned prior to painting.

VI. Land and Building

120 Square metres of covered area is to be rented @ Rs. 5/- per sq. metre per month. • • • 600.00

VII. Machinery and Equipment

1. Treadle Guillotine shearing M/C.—1200 mm capacity.	Rs. 5,000.00
2. Hand operated Notching Machine size of table—450 mm x 300 mm.	1,400.00
3. Hand operated CMT type Folding M/c capacity 80" x 14 S.W.G.	14,000.00
4. Arc Welding Transformer amp. range 35 to 300.	5,000.00
5. Hand operated Hydraulic Tube Bending Machine $\frac{1}{2}$ " to 2" capacity—2 nos.	5,200.00
6. $\frac{1}{2}$ " capacity Drill M/c.	2,000.00
7. Portable Spraying machine.	2,000.00
8. Stoving chamber 8' x 4' x 4".	10,000.00
9. Pickling Tanks.	2,000.00
10. Work Bench, Hand Tools etc.	5,000.00
11. Furnitures, Office Equipment.	5,000.00
12. Erection, electrification.	3,400.00
	60,000.00

VIII. Salaries And Wages (Per Month)

	Rs.
1. Manager.	1,000.00
2. Skilled workers—4 nos.	1,600.00
3. Semi-skilled workers—6 nos.	1,500.00
4. Unskilled workers—2 nos.	400.00
5. Clerk-cum-Storekeeper.	600.00
6. Peon-cum-Watchman—2 nos.	400.00
7. Labour amenities.	500.00
	6,000.00

IX. Raw Materials (per Month)	Rs.
1. M.S. Sheets 1·5 M.T. @ Rs. 3200/M.T.	4,800·00
2. M.S. rods, angles etc. M.T @ Rs. 2600/M.T.	1,300·00
3. Screws, rivets, washers etc.	300·00
4. M.S. Tubes 18 G, 7/8" dia & 20 G, 1/2" dia @ Rs. 5/- per metre average—400 metres.	2,000·00
5. Paint.	1,000·00
	<u>9,400·00</u>

X. Other Expenses (Per Month)	Rs.
1. Rent.	600·00
2. Power and Electricity.	250·00
3. Consumable stores.	200·00
4. Maintenance and replacement of small tools.	500·00
5. Transport, Packing Forwarding.	500·00
6. Marketing expenses.	400·00
7. Contingencies.	150·00
	<u>2,600·00</u>

XI. Working Capital (3 month's recurring expenses)	
1. Salaries and wages.	1,800·00
2. Raw Materials.	28,200·00
3. Other expenses.	7,800·00
	<u>54,000·00</u>

XII. Capital Investments	Rs.
1. Fixed	60,000·00
2. Working	54,000·00
	<u>1,14,300·00</u>

XIII Cost of Production (Annual)	
1. Salaries and wages.	72,000·00
2. Raw Materials.	1,12,800·00
3. Other expenses.	31,200·00
4. Depreciation of M/c. @ 10% per annum.	6,000·00
5. Interest on Capital investment @ 15% per annum.	17,100·00
	<u>2,39,100·00</u>

XIV. Sales Proceeds (Annual)	Rs.
By sales of 1800 nos. of tables @ Rs. 150/- each.	2,70,000·00

XV. Profit ability (Before taxes).

$$\text{Profit} = \text{XIV} - \text{XIII} = \text{Rs. } (270000 - 239100) \\ = \text{Rs. } 30900$$

The profit is 11·5% of Sales and 27% of Capital Investment.

XVI. Break Even Analysis

A. Fixed Cost	Rs.
1. Depreciation of machinery.	6,000·00
2. Interest on Capital Investment.	17,100·00
3. Rent.	7,200·00
4. 40% of Salaries & Wages.	240·00
5. 40% of Other expenses.	800·00
	<u>31,340·00</u>

$$\text{B.E.R.} = \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profits}} \\ = \frac{31340 \times 100}{31340 + 30900} \\ = \frac{3134000}{62240} \\ = 50·3\%$$

XVII. Sources of Machines

1. International machine Tools Corporation,
5, Bank Street, Behind State Bank, Fort,
Bombay-400023.
2. Maneklal & Sons,
23 Ganesh Ch. Avenue,
Calcutta-700013.
3. Ashok Bros.,
37, Panchkuin Road,
New Delhi-110001.

(Reserved item Sl. No. 404).

I. Product and Its Uses

India being a hot country Sun Shades are needed to protect driver's vision from the bright sun shine falling on the glass in front of driver's seat and reflecting on his eyes. For this, a panel, formed according to the profile of hood and cowl of passenger cars are bolted just above the front and curvatures. These parts are optionally fitted by customers, generally from automobile spare parts dealers. For this, production can be carried out in small scale and marketed in different localities. This item has been reserved for manufacture exclusively in small scale sector.

II. Market Potential

Production of passenger cars in India for 75-76, 76-77 and 77-78 was 21767 nos. 36490 nos. and 33851 nos. respectively. Demand for this item even on 50 percent basis may be taken as 1600 per annum. But for marketing in a localised manner for the facility of small scale operation, the production target must be kept low and methods of manufacture should be selected accordingly.

III. Production Target

Production rate has been estimated as 500 nos. per month.

IV. Production Details and Methods of Manufactur.

In view of the above requirement, production is to be carried out with labour intensive process with minimum amount of investment on machines. For this, the sheets are to be cut in treadle guillotine sheering machine to size and formed in hand operated Press Brake machine. Grooving also can be done in the same machine with separate die. The parts are to be painted according to the customer's requirement which are matched with body colours of the vehicles.

V. Quality Control and Standards

There is no Indian Standard Specification for this item. However, this item is required by sophisticated customers. Therefore, workmanship and finish has to be of high standard. The accuracy of workmanship will depend to a great extent on good dies and tools. So, attention to this aspect will have to be given while procuring these initially.

VI. Land and Building

60 Square metres covered area to be rented@ Rs. 5/- per sq. metre per month	Rs. 300·00
--	---------------

VII. Machinery and Equipment

1. Treadle Guillotine Shearing M/c. Capa. —1200mm.	5,000·00
2. Hand operated Press Brake Capacity in mild steel—3mm stock thickness.	10,000·00
3. Double bodied Fly Press No. 12	5,000·00
4. Spray Painting Equipment	3,000·00
5. Work bench, vise, hand tools	4,000·00
6. Dies, Formats etc.	4,000·00
7. Furnitures and office equipment	4,000·00
8. Erection and installation	3,000·00
	38,000·00

VIII. Salaries And Wages (Monthly)

1. Supervisor	800·00
2. Clerk-cum-storekeeper	600·00
3. Skilled workers @ Rs. 400 per month	800·00
4. Semi-Skilled workers @ Rs. 250 per month	500·00
5. Unskilled workers @ Rs. 200 per month	600·00
6. Watchman-cum-Peon @ Rs. 200 per month	200·00
7. Labour amenities	500·00
	4,000·00

IX. Raw Materials (Monthly)

	Rs.
2. M.S. Sheets 3 M.T. @ Rs. 4500 per M.T.	13,500·00
2. Paint and Sundry materials	1,000·00
	14,500·00

X. Other Expenses (Monthly)

	Rs.
1. Rent	300·00
2. Maintenance and purchase of small tools	300·00
3. Transport, Packing Conveyance	500·00
4. Electricity and consumable stores	200·00
5. Contingencies	200·00
	1,500·00

XI. Working Capital (3 Months recurring Expenses)

	Rs.
1. Salaries and wages.	12,000·00
2. Raw Materials	43,500·00
3. Other expenses	4,500·00
	60,000·00

XII. Capital Investment

	Rs.
1. Fixed	38,000·00
2. Working	60,000·00
	98,000·00

XIII. Cost of Production (Annual)

	Rs.
1. Salaries and wages.	48,000·00
2. Raw Materials	1,74,000·00
3. Other expenses	16,800·00
4. Depreciation of m/s. @10% per annum .	18,000·00
5. Interest on Capital Investment @15% per annum	14,700·00
6. M Marketing expenses 10% of sales	30,000·00
	30,15·00

XIV. Sales Proceeds (Annual)
00 Sun x shades @Rs. 60/- eachRs.
3,60,000·00**XV. Profitability (Before Charging Taxes)**

Profit—XIII—XII = Rs. (360000—301500)
= Rs. 59500

The profit is 16·25 % of Sales and 60% of Capital Investment

XVI. Break Even Analysis*Fixed cost*

	Rs.
1. Depreciation of machinery	3,800·00
2. Interest on Capital Investment	14,700·00
3. Rent	3,600·00
4. 40% of Salaries and wages	19,200·00
5. 40% of other expenses	5,760·00
	47,060·00

Break Even Point

$$\begin{aligned} &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\ &= \frac{47060 \times 100}{47060 + 59500} \\ &= 44\% \end{aligned}$$

XVII. Sources of Machinery

1. Machine Tools Traders (Cal.),
25 Ganesh Chandra Avenue, Calcutta-700 013.
2. Maneklal & Sons,
115/116 Narayan Dhuru Street, Bombay-400 003.
3. Ashok Bros., 37, Panchkuin Road, P. B. No. 305,
New Delhi-110001.

(Reserved item Sl. No. 642)

TABLE CUTLERY

I. Production and Their Uses

In western style of taking food, spoons, forks and knives are essential items in table service. In hotels and restaurants in our country, even in small towns, table service with forks and spoons are customary. Table cutlery items are suitable for manufacture in small scale industry. The materials used in their manufacture differ from manufacturer to manufacturer. However, stainless steel cutlery has become most popular for use in table cutlery.

II. Market Potential

With growth of urbanisation, change of style of living and food habits, demands for table cutlery is increasing day by day. It is expected that the demand will be increasing progressively so the marketing will not be a problem for the small scale units.

III. Production Target

The estimates of this profile is based on monthly production of 1500 dozens each of spoons and knives and 750 dozens of Forks, made out of scrap stainless steel sheets and rods. Scraps to the full extent may not be available. For this estimates of raw material price have been kept higher level than the prevalent prices of scrap in the market.

IV. Production Details and Methods of Manufacture

Forks spoons and knives will have to be forged to shape from cut pieces or scrap available from different sources. This will minimise the raw material wastage and keep the cost of production down. Further to shaping finished form of spoon and forks will be obtained by hot pressing and trimming. In case of forks with hollow handles, the blanks will be made in one piece. And in case of forks with hollow and plastic handles, prongs of desired shape are to be made. The prongs shall be properly curved and tapered. The prongs of fish forks are required to be finished blunt in the end points. Table forks have sharpened ends, stainless steel has got special customer's appeal due to its shining quality. Therefore, it is necessary to have efficient surface finishing operation prior to packing.

V. Quality Control and Standards

The following I.S. specifications will provide helpful guidance in manufacturing.

IS : 990—Spoons, stainless steel

IS : 992—Forks (table, fish and serving) stainless steel

IS : 994—Butter knives and fish knives.

IS : 995—Table knives, dessert knives and print knives.

IS : 3546—Vegetable knives.

Since work will be carried out with various types of materials it may be helpful to have specified dimensions in forging stage and have strict control over the same for keeping down the overall cost of production.

VI. Land & Building

70 square metres covered area to be rented @Rs. 5/- per sq. metre per month	Rs. 350.00
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VII. Machinery and Equipment

	Rs.
1. Friction screw press up stroke cap. 50 tonnes.	80,000.00
2. Trimming press 40 Tonnes. cap.	18,000.00
3. Forge with blower and motor	2,500.00
4. Double Body fly press No. 10	4,500.00
5. Double ended polishing m/c—4 Nos.	4,000.00
6. Double ended grinder.	1,200.00
7. Bench drill machine—1/2" cap.	2,400.00
8. Hardening furnace	7,500.00
9. Tempering furnace	5,600.00
10. Quenching tanks and accessories	1,800.00
11. Work Bench, Hand tools, vises	3,000.00
12. Dies	5,000.00
13. Furnitures, office equipment	5,000.00
14. Installation, electrification	12,500.00
	1,53,000.00

VIII. Salaries and wages (per month)

	Rs.
1. Supervisor	800.00
2. Skilled workers @Rs. 400/- per head	800.00
3. Semi-skilled workers @Rs. 250/- per head	1,000.00
4. Unskilled workers @Rs. 200/- per head	400.00
5. Clerk-cum-storekeeper	500.00
6. Watchman per head	250.00
7. Labour amenities	750.00
	4,500.00

X. Raw materials (per month)	Rs.
1. Stainless steel scrap (sheets, roots etc) 1·5 M.T. Rs. 30,000/- per M.T.	45,000·00
2. Handles and consumable stores such as coal etc.	3,000·000
	<u>48,000·00</u>

X. Other expenses (per month)	Rs.
1. Rent	350·00
2. Power, electricity bills	200·00
3. Maintenance and replacement of small tools	350·00
4. Packing, forwarding conveyance	500·00
5. Contingencies	200·00
	<u>1,800·00</u>

XI. Working Capital (3 months Recurring Expenses)	Rs.
1. Salaries and wages	13,500·00
2. Raw materials	1,44,000·00
3. Other expenses	5,400·00
	<u>1,62,900·00</u>

XII. Capital Investment	Rs.
1. Fixed	1,53,000·00
2. Working	1,62,900·00
	<u>3,15,900·00</u>
Say Rs.	<u>3,16,000·00</u>

XIII. Cost of Production (Annual)	Rs.
1. Salaries and wages	54,000·00
2. Raw materials	5,76,000·00
3. Other' expenses	21,600·00
4. Depreciation of m/c @ 10% per annum	15,300·00
5. Interest on capital investment @ 15% per annum	47,400·00
	<u>7,14,300·00</u>

XIV. Sales Proceeds (Annual)	Rs.
1. 18000 dozens of tea spoons @ Rs. 1·00 each.	2,16,000·00
2. 900 dozens of table forks @ Rs. 2·00 each.	2,16,000·00
3. 1800 dozens of table knives @Rs. 1·75 each.	3,78,000·00
	<u>8,10,000·00</u>

XV. Profitability (Before taxes)

Profit = XIV—XIII = Rs. (810000—714300)
=Rs. 95700

The profit is 11·8% of sales and 30% of capital Investment.

VI. Break Even Analysis.

Fixed Cost

	Rs.
1. Depreciation of machinery	15,300·00
2. Interest on capital investment	47,400·00
3. Rent	4,200·00
4. 40% of salaries and wages	21,600·00
5. 40% of other expenses	6,960·00
	<u>95,460·00</u>

$$\begin{aligned} \text{Break even Point} &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\ &= \frac{95460 \times 100}{95460 + 95700} \\ &= \frac{9546000}{191160} \\ &= 50\% \text{---nearly.} \\ &= 50\% \end{aligned}$$

XVII. Sources of Machines

1. Birson Industries,
262, Industrial Area 'A',
Office : G.T. Road Near Manju Cinema,
Ludhiana-3.
2. Maneklal & Sons,
115, Narayana Dhuru Street.
3. Bysakh & Co.,
55 N. C., Banarjee Street,
Calcutta-6.
4. Pioneer Equipment Co. P. Ltd.
Post Box. 1909, Bombay-1.
5. International Machine Tools Corp.
P.B. No. 799 Fort Bombay-1.

} Heat treatment
furnaces.

(Reserved items Sl. No. 468, 469 & 470).

I. Product and Its Use

ROUND Block is extensively used during electric wiring. Timber like teak, deodar and hollowing are generally used for manufacture of the item. Here in the scheme teak has been taken as the main raw material.

II. Market Potential

The main reason for increasing demand of round block is the increase in building activities. More houses are being electrified with the programme of electrification in rural as well as urban areas. Considering the above fact, the demand is considered to be on increase.

III. Product Target

This scheme envisages a production of 5000 round block/month on single shift basis. The scheme is complete in all respect.

IV. Product Details of Process of Manufacture

Short cut pieces of teaks are procured from local market. The timber is turned in wood working lathe. The block consists of two parts, lower & upper block. After turning and parting the blocks are sand polished in sander. Thereafter holes are drilled for wire screw and finished by polishing.

Sequence of operation

1. Sizing wooden bars by hand saw if necessary.
2. Turning.
3. Sand polishing.
4. Drilling.
5. Polishing.

V. Inspection of Quality Control

As the product is not a complicated and high precision store critical check is not required. However care should be taken to check procurement of specified raw material. During processing dimensional check will ensure product of specified sizes.

VI. Land and Building

Workshop shed—15m × 10m Covered—Rented.

VII. Machinery & Equipment

		Rs.
1. Wood turning lathe with motor 1 H. P.	2 nos. @4000	8,000·00
2. Disc. sander with 1 H.P. motor	1 no.	1,000·00
3. Drill machine $\frac{1}{2}$ " cap. with 1 H.P. motor	1 no.	3,000·00
4. Double ended grinder 6" cap.	1 no.	2,000·00
5. Tools etc.	L.S.	500·00
6. Installation & electrification		1,500·00
		16,000·00

VIII. Raw Material Per Month

1. Timber short cut pieces like teak 10Q cft. @ 50·00 cft.		5,000·00
2. Screw and polish	L.S.	500·00
		5,500·00

IX. Staff & Labour

1. Manager cum Supervisor	1 no. @500	500·00
2. Carpenter cum machine operator	3 nos. @ 300	900·00
3. Unskilled	1 no. @ 250	250·00
4. Watchman	1 no. @ 200	200·00
		1,850·00
Cost of labour benefit 10%		185·00
		2,035·00

X. Other Expenses

	Rs.
1. Rent	250·00
2. Electricity	150·00
3. Consumable tools	50·00
4. Lubricants & Other consumable store	50·00
5. Maintenance	50·00
6. Cartage & freight	200·00
7. Packing & publicity	50·00
8. Sales expenses including travelling	100·00
9. Stationery, postage	50·00
10. Insurance legal charge, licence etc.	100·00
	1,050·00

XI. Working Capital

	Rs.
1. Raw material	5,500·00
2. Staff & Labour	2,035·00
3. Other expenses	1,050·00
	8,585·00

XII. Total Capital Investment

	Rs.
1. Machinery & equipment	16,000·00
2. Working capital for 3 months	25,755·00
	<u>41,755·00</u>

XIII. Cost of Production (Per Annum)

	Rs.
1. Raw material	66,000·00
2. Staff & Labour	24,420·00
3. Other expenses	12,600·00
4. Interest on capital 15%	6,263·00
5. Depreciation on m/c.	1,600·00
	<u>1,10,883·00</u>
Say—Rs.	<u>1,10,900·00</u>

XIV. Total Sale (Per Annum)

1. By sale of 60·000 pcs. of round block annum @ 2·00 per pc.	1,20,000·00
2. Saw dust	900·00
	<u>1,20,900·00</u>

XV. Profitability

	Total sale 1,20,900	Cost of Production 1,10,900	Profit 10,000
(a) Percentage of profit on sale	$= \frac{10,000 \times 100}{1,20,900} = 8·2\%$		
(b) Percentage of return over investment	$= \frac{10,000 \times 100}{41,755} = 24\% \text{ (approx.)}$		

Break even analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{Annual profit.}}$$

Annual fixed cost (per annum)

	Rs.
1. Rent	3,000·00
2. Interest	6,263·00
3. Depreciation on m/c.	1,600·00
4. 40% of salary	9,768·00
5. 40% of other expenses	3,840·00
	<u>24,471·00</u>

$$\text{B.E.P.} = \frac{24,471 \times 100}{24,471 + 10,000} = 70\%$$

Sources of machinery

1. M/s. Atlas Engg. Industries,
G.T. Road, Batala (Punjab)
2. M/s. Varat Machinery,
67B, N.S Road, Calcutta-1.

(Reserved item Sl. No. 46)

I. Product and Its Use

Tea chest plywood is necessary for making Tea chests for packaging processed tea. Garden tea is packed in tea chests for despatching outside.

II. Market Potential

Tea is a major cash crop in the country. Indian Tea has got enough demand in the International markets. Country earns quite a good amount of foreign exchange by exporting tea. Domestic market is also expanding steadily as tea has become a routine drink, practically in every household. Since the production of tea is rapidly increasing, the demand for tea chest is also increasing in the same proportion.

III. Production Target

The project envisages to produce 10,000 sets of Tea chest plywood per month or 1,20,000 sets per annum.

IV. Production details & Process of manufacture

Timber mango, hollock etc. are generally used for manufacture of tea chest plywood. The timber is cut to size by hand saw and debarked. The cut pieces are mounted on peeling lathe for peeling off veneer. Thickness of such veneer is around 1.4 mm, veneers are then chopped to size. Green veneers are dried in mechanical drier. Dry veneers are glued in glue spreader. 3 pieces of veneers i.e. 2 face veneer and a core are required, for making the plywood for tea chest. After gluing the veneers they are pressed in bundles in a hydraulic press and retained in clamps for about 24 hours. Plywood thus formed are next machined to size in D.D. Saw and may be embossed before storage/delivery.

V. Inspection and Quality Control

A well equipped testing laboratory is necessary under the control of qualified chemist in plywood factory. Apart from dimensional measurement, testing is necessary for tensile strength (Wet & dry), moisture, bonding property of glue etc. With proper analytical and physical testing at various stages the product can be made as per standard, specification.

VI. Land and Building

1. Covered area—300 sq. mt. @ Rs. 3·00	
sq. mt.	900·00
2. Uncovered area—200 sq. mt. @ 25 paise/	
sq. mt.	250·00
Rs.	1,150·00
	(Rental)

VII. Plant and Machinery

(i) Peeling machine 42" with 25 H.P. motor & accessories	1 no.	70,000·00
(ii) Hand chopping	3 nos.	1,350·00
(iii) Glue mixer with 1 H.P. motor & accessories	1 no.	4,050·00
(iv) Glue spreader 36" with 1 H.P. motor & accessories	1 no.	7,000·00
(v) Hydraulic press 30"×30" with 5 H.P. Motor & accessories	1 no.	26,000·00
(vi) M.S. Retaining clamps 20 sets		9,000·00
(vii) M.S. Retaining joists a set for 20 sets		8,000·00
(viii) Belt sanding machine 42" with 3 H.P. Motor & accessories	1 no.	8,000·00
(ix) Embossing machine treadle type with accessories	1 no.	3,500·00
(x) Chain pulley block 2 tons cap.	1 no.	3,000·00
(xi) Automatic Roller truck Veneer drier—14' & 22'—4 tracks with 12+10+3 H.P. Motors	1 no.	1,40,000·00
(xii) One V.E.T. boiler (coal fired) 4'×9'×100 P. S. I.	1 no.	1,10,000·00
(xiii) D.D. Saw 36" with 5 H.P. motor	2 no.	20,000·00
(xiv) Tensometer with accessories	1 no.	5,000·00
(xv) Rectangular drying & steriliser oven Bed 12" & 12" 1"×4", temp. up to 240°C	1 no.	1,400·00
(xvi) Analytical weight box (10—100 grms)	1 set	150·00
(xvii) One chemical balance Model K-6 cap. 200 grms.	1 no.	450·00
Sales tax 6%		25,000·00
Surcharge @ 10% on sales tax		2,500·00
Installation charges @ 10%		41,700·00
Rs.		4,86,100·00

Say—Rs. 4,86,000·00

VIII. Raw Materials (Per month)

	Rate	Total cost
		Rs.
1. Timber @ 45 cft. for 100 sets (all sizes)=4500 cft.	11.00/cft.	49,500.00
2. Resin @ 25 kgs. 100 sets (all sizes)=2500 kgs.	7.50/kg.	18,750.00
3. Tamarind powder or tapioca powder @ 1.2kg/100 sets—1200 kg.	110/75 kgs.	1,760.00
4. Hardner @10kgs/100 sets (all sizes)@1000 kgs.	@2.50 per kg.	2,500.00
		72,510.00

IX. Salary and Wages (Per Month)

Category 'A'

		Rs.
Manager	One	800.00
Chemist	One	450.00
Clerk/Accountant	One	350.00
Watchman	One	200.00
		1,800.00

Category 'B'

		Rs.
(i) Supervisor	One	500.00
(ii) Machineman @ Rs. 300.00 per head	Four	1,200.00
(iii) Semi-skilled @ Rs. 10.00 per day	Four	1,000.00
(iv) Unskilled @ Rs. 8.00 per day	Twelve	2,400.00
(v) Boiler man @ Rs. 300.00 p.m.	One	300.00
(vi) Assistant to Boiler @ Rs. 200 p.m.	One	200.00
		5,600.00
(Rs. 1800+5600)=		7,400.00
Cost of labour benefit @ 10%		740.00
		8,140.00

X. Other Items of Expenditure (per month)

	Rs.
1. Rent	1,150.00
2. Electricity	2,000.00
3. Maintenance	500.00
4. Transport	3,000.00
5. Consumables, tools etc.	500.00
6. Other consumables including coal	2,400.00
7. Publicity	500.00
8. Packing & forwarding	500.00
9. Sales expenses	500.00
10. Stationery	300.00
	11,350.00

XI. Working Capital (per month)

	Rs.
1. Raw material	72,510.00
2. Staff & labour	8,140.00
3. Other expenses	11,350.00
	92,000.00

XII. Capital Investment

	Rs.
Block Capital	4,86,000.00
Working capital for 3 months	2,76,000.00
	7,62,000.00

XIII. Cost of Production (per Annum)

	Rs.
1. Raw material	8,70,120.00
2. Staff & Labour	92,840.00
3. Other expenses	1,36,200.00
4. Interest on capital @15%	1,13,850.00
5. Depreciation on machinery @ 10%	48,600.00
	12,61,610.00
Say Rs.	12,62,000.00

XIV. Total Sale (per Annum)

	Rs.
By sale of 1,20,000 sets of tea chest plywood @ 12.00 per set	14,40,000.00

XV. Profitability (per Annum)

	Rs.
Total sale	14,40,000.00
Cost of production	12,62,000.00
Profit	1,78,000.00
(a) Percentage of the profit on sale	$\frac{1,78,000 \times 100}{14,40,000} = 12\%$ approx.
(b) Percentage of return on capital	$\frac{1,78,000 \times 100}{7,62,000} = 22\%$

XVI. Break even Analysis

$$B.E.P. = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{Annual project}}$$

Annual Fixed cost

	Rs.
1. Rent	13,800.00
2. Interest	1,13,850.00
3. Depreciation on m/cs.	48,600.00
4. 40% of salary	37,136.00
5. 40% of other expenses	54,480.00
	2,67,866.00
Say Rs.	2,68,000.00

$$B.E.P. = \frac{268000 \times 100}{268000 + 1,78,000} = 60\% \text{ approx.}$$

XVII. Names and Address of Machinery Suppliers

1. M/s. Varat Machinery, 105, Ultadanga Main Rd., Cal-67.
2. M/s. B.S. Engg. Corpn. 117, Raja Dinendra St. Cal-4.
3. M/s. Bharat Machines & Malleables Sree Sankaran estate, Chiyaram, Trichur.

(Reserved item Sl. No. 39).

Product and Its Uses

At the present age of every industry the drawings and designs are indispensable. To reflect any ideas through the design, the Tee square are used which is part and parcel of Drawing Board. Tee square are used in the Drawing Board for the drawing of horizontal lines on the same plane. On the Tee square, Set square are placed to get the vertical and angular lines.

I. Market Potential

Due to advancement of engineering technology the use of drawing equipments are also increasing day by day in an accelerated rate. These are required in all the technical school/colleges and engineering industries. So the demand of these items are never apprehended for saturation.

II. Production Target

It is proposed to manufacture 50 Tee squares per day. The production programme envisages to manufacture of all types of Tee squares. For the purpose of calculation the scheme has been based on Imperial size.

V. Product Details and Process of Manufacture

Manufacture of Tee square is very simple. First the seasoned and sawn timber is to be selected. The size and shapes are done in circular saw machine, thickness and joint planner. Lastly two pieces are joined with screw to get the Tee shape.

V. Inspection and Quality Control

Tee squares are made with rigid inspection in order to avoid any error. Special gauges are to be made to maintain the edges which forms the Right Angle.

I. Land and Building

	Rs.
Covered area 60 sq. metre—Rented	150.00

II. Machinery and Equipment

1. 300 mm. Tilling arbour circular saw with 1 H.P. motor & accessories	1 no.	3,000.00
2. 300 x 100 mm. thickness planner with 2 H.P. motor and accessories	1 no.	8,500.00
3. Hand feed joint planner with 1 H.P. motor & accessories Table size—500 x 700	1 no.	4,500.00

		Rs.
4. Belt & disc sander 1200 x 600 mm with 1/2 H.P. motor & accessories	1 no.	1,800.00
5. 1/2" cap. Bench Drill with 1/2 H.P. motor & accessories	1 no.	950.00
6. Carpentry tools measuring instrument etc.	L.S.	1,000.00
		19,750.00
7. Installation & electrification		2,000.00
8. Furniture, fixture including office equipment		2,000.00
		23,750.00

VIII. Raw Material (per month)

		Rs.
1. Seasoned sawn C.P. Teak wood—125 cft.	@80.00 cft.	10,000.00
2. Brass screw		300.00
3. Varnish, spirit etc.	L.S.	200.00
		10,500.00

IX. Staff and Labour (per month)

		Rs.
1. Manager	1 no.	600.00
2. Supervisor	1 no.	400.00
3. Skilled operator	2 nos.	600.00
4. Unskilled worker	2 nos.	400.00
5. Watchman cum peon	1 no.	200.00
6. Cost of Labour benefits @%		2,200.00
		220.00

X. Other Expenses (per month)

		Rs.
1. Rent		150.00
2. Electricity		150.00
3. Consumable tools, oils, lubricants, and other consumable		100.00
4. Cartage & freight		200.00
5. Packing cost		150.00
6. Publicity		50.00
7. Sales, expenses including travelling		100.00
8. Stationery, postage & other misc. expenditure		100.00
		1,000.00

XI. Working Capital Required (per annum)

		Rs.
1. Raw material		10,500.00
2. Staff & labour		2,420.00
3. Other expenses		1,000.00
		13,920.00

XII. Total Capital Investment

	Rs.
1. Machinery & equipment . . .	23,750.00
2. Working capital for 3 months .	41,760.00
	<u>65,510.00</u>
Say Rs.	<u>66,000.00</u>

XIII. Cost of Production (per annum)

	Rs.
1. Raw material	1,26,000.00
2. Staff & Labour	29,000.00
3. Other expenses	12,000.00
4. Interest on capital @15 % . .	9,900.00
5. Depreciation on machinery @5% .	1,150.00
	<u>1,78,090.00</u>

XIV. Total Sale (per annum)

	Rs.
By sale of 15,000.00 Imperial size Tee square @13.00 pcs.	1,95,000.00

XV. Profitability

Total sale	Cost of production	Profit
1,95,000.00	1,78,090.00	16,910.00
(a) Percentage of profit on Sale	$\frac{16,910 \times 100}{1,95,000}$	= 8.7% approx.
(b) Percentage of profit over Investment	$\frac{16,910 \times 100}{66,000}$	= 26% approx.

XVI. B.E. Analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{profit}}$$

Fixed cost (per Annum)

1. Rent	1,800.00
2. Interest	9,900.00
3. Depreciation on machines & equipment	1,150.00
4. 40% of salaries	11,600.00
5. 40% of other expenses (exclusive rent)	4,000.00
	<u>28,450.00</u>

$$\text{B.E.P.} = \frac{28,450 \times 100}{47,360} = 58\% \text{ approx.}$$

XVII. Names and Address of Machinery Supplier

- (a) M/s. Perfect Machine Tools,
123, Mount Road, Madras-6.
- (2) M/s. Turner & Tools,
15, G. C. Avenue, Calcutta-13.
- (3) M/s. Turnwell Machine Tools,
16, G. C. Avenue, Calcutta-13.
- (4) M/s. Suggs Engg. Works (P) Ltd.
8/39, South Industrial Area,
Kirtinagar, New Delhi-15.

(Reserved item Sl. No. 757)

I. Product and Its Uses

The product hardly needs any introduction as it is quite common amongst the children. It is a major source of recreation, for the children especially in the urban areas. The tri-cycle has become much popular during the last about ten years. With the increase in demand, a number of units have come up for the manufacture of this item. The demand is ever growing due to the increase in population and the purchasing power of the people. The item has therefore very good demand potential and it can be easily taken up by the skilled artisans.

II. Production Targets

It is proposed to manufacture 625 tri-cycles per month.

III. Production details and Process of manufacture

The tri-cycle is quite a simple item and it is made out of steel pipes, M.S. strips and rounds, M.S. Sheets etc. by fabrication. The various parts are formed to the desired shape with the help of pipe bending fixtures, presses and other machines. The cycle frame is then completed by gas welding, revetting and bolting together of different pieces. Some of the items like handle require electroplating. Other items are painted. The items like seat, padels, solid rubber tyres etc. are purchased from the market and the assembly completed.

IV. Inspection and Quality Control

There are no ISI Specifications on the item. But for the sake of easy and quick assembly, the concept of inter-changeability has to be maintained. The proper and true running of wheels has also to be checked.

V. Land and Building

	Rs.
Covered area 150 Sq. Metres (Rented)	750.00 p.m.

VI. Machinery & Equipment

1. Centre lathe 4' bed length complete with 2 H.P. Electric Motors and Starter	6,000.00
2. Power Hacksaw complete with 1 H.P. Motor and Starter	2,000.00
3. Bench Drilling Machine 1/2" cap with 0.5 H. P. Motor and Starter	1,000.00

4. Double ended bench tool grinder 10" wheel Cap	1	Rs. 1,500.00
5. Fly Press No. 3	1	1,000.00
6. Lever type hand operated Shearing Machines 1/4" cap	1	1,200.00
7. Pipe bending machine hand operated	1	1,500.00
8. Gas Welding set complete with acetelene generators, regulators, oxygen gas cylinders, hoses and torch etc.	1	3,000.00
9. Black Smithy hearth with blower etc.	1	1,000.00
10. Electroplating plant complete with dynamo, tanks, bus bars and other accessories	1	25,000.00
11. Air Compressor complete with Spray gun and other accessories	1	3,000.00
12. Installation & Electrification etc.	L.S.	4,500.00
13. Office furniture and equipments	L.S.	1,500.00
14. Tools, Dies, Jigs & Fixtures	L. S.	2,800.00
Total Fixed Investment		55,000.00

VII. Raw Material Requirements (per month)

	Rs.
1. M/S. Pipe 1/2" to 11" dia—2100 ft.	4,000.00
2. M/S Flat 1/8" thick $\times$ 1/2" to 3/4" width 1 Tonne	3,000.00
3. MS Rod 3/16" dia $\times$ 1/2" 500 Kg.	1,300.00
4. BP Sheet 18 S.W.G. 700 Kg.	2,800.00
5. Bolts, nuts, screws and rivets	1,200.00
6. Leather seat, solid rubber tyres padels, rexine cushioning and other materials @ Rs. 8/- per cycle	5,000.00
7. Paints, chemicals and Nickle etc. @ Rs. 2/- per pc.	1,250.00
Total	18,550.00

VIII. Staff and Labour (per month)

	Rs.
1. Foreman	500.00
2. Storekeeper	300.00
3. Chowkidar	200.00
4. Skilled worker	700.00
5. Semi-skilled workers	750.00
6. Welder	350.00
7. Painters	350.00
8. Electroplater	400.00
9. Helpers	400.00
Total	3,950.00

IX. Other Expenses (per month)

	Rs.
1. Electricity and water	250.00
2. Consumable tools	100.00
3. Oils and Lubricants etc. . . .	100.00
4. Coal and Fire Wood etc. . . .	150.00
5. Tools & Dies	300.00
6. Postage, Stationery etc. . . .	50.00
7. Travelling, freight and other expenses	400.00
8. Rent	760.00
	<u>2,100.00</u>

X. Working Capital required (for 3 months)

	Rs.
1. Raw materials = $18,550 \times 3$	55,650.00
2. Salaries & Wages = $3,950 \times 3$	11,850.00
3. Other expenses = $2,100 \times 3$	6,300.00
	<u>73,800.00</u>

XI. Total Capital Investment

	Rs.
1. Total Fixed Investment on Machinery & equipment	55,000.00
2. Working Capital for 3 months	73,800.00
	<u>1,28,800.00</u>
Say Rs.	1,29,000.00

XII. Cost of production (per annum)

	Rs.
1. Recurring Expenses = $73,800 \times 4$	2,95,200.00
2. Interest on capital @ 15%	19,350.00
3. Depreciation on Machinery & Equipment @ 10%	5,500.00
4. Sales Expenses	5,000.00
	<u>3,25,050.00</u>
Say Rs.	3,25,000.000

XIII. Sales Proceeds (per annum)

	Rs.
1. By sale of 2700 tri-cycles with double carriers @ Rs. 55 per pc. . . .	1,48,500.00
2. By sale of 4800 cycles with single carrier Rs. 50 per pc. . . .	2,40,000.00
	<u>3,88,500.00</u>

XIV. Profitability

$$\begin{aligned} \text{Profit} &= \text{Total Sales} - \text{Cost of Production} \\ &= 3,88,500 - 3,25,000 \\ &= 63,500 \end{aligned}$$

$$(a) \text{ Percentage of Profit on sales } = \frac{63,500 \times 100}{3,88,500} = 16.3\%$$

$$(b) \text{ Percentage of return on investment } = \frac{63,500 \times 100}{1,29,000} = 49\%$$

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{profit.}}$$

Fixed Cost (per annum)

	Rs.
1. Rent	9,000.00
2. Interest on capital	19,350.00
3. Depreciation	5,500.00
4. 40% of salaries	18,960.00
5. 40% of other expenses	6,480.00
	<u>59,290.00</u>
Say Rs.	59,300.00

$$\text{B.E.P.} = \frac{59,300 \times 100}{59,300 \text{ plus } 63,500} = \frac{59,300}{1,22,800} \times 100 = 48.2\%$$

XVI. Names and Addresses of Suppliers of Machinery & equipments

1. M/s. Batliboi & Co. (P) Ltd.
190-A, Forbes Street,
Bombay-400001.
2. M/s Perfect Machines Tools Co. (P) Ltd.
Bell Building,
Sir P. M. Road,
Bombay-400001.
3. M/s. New Era Industries,
Ferozepur Road, Near Punjab Agricultural University
Ludhiana.
4. M/s. Millhard & Co. (P) Ltd.,
G.T. Road,
Miller Ganj,
Ludhiana-141003.
5. M/s. Hind Rectifiers Ltd.,
Mahalaxmi Chambers
Bhulabhai Desai Road,
Bombay-400026.
6. M/s. Toshnival Brothers,
Jhandewala Extension
New Delhi.
7. M/s. Advani Oerilikon Ltd.,
Block D. Ground Floor,
Shivsagar Estate,
Dr. Annie Besant Road, Worli,
Bombay-400018.
8. M/s. Automatic Electric Ltd.,
Post Box 7103,
Bombay-400031.

Electroplating Plant.

(Reserved item Sl. No. 724).

I. (a) Steel furniture is generally classified under groups namely hospital furniture, domestic, office and factory furniture. Under the series of hospital furniture items such as trolleys—stretchers, trolleys patient, stretcher and stretcher carriers, trolleys—soiled linen. Tables over bedstand—wash hand basin, lockers bed side are general and common hospital furniture.

(b) Market potential

The potential demand for the above types of hospital furniture is considered to be good. With the rapid increase in the health centres & hospital, emphasis is laid to provide more & better medical facilities in the villages and small towns.

II. Production Target

Assorted types of hospital trolleys & furniture—700 nos. per month.

III. Production details and process of manufacture

Generally the following operations are involved in the manufacture of hospital furniture of above indicated items:—

- (i) Shearing : Shearing of sheet is done with the help of guillotine shearing machine and hand shearing machine.
- (ii) Folding : The ends are folded or formed with a folding machine or with a bending brake.
- (iii) Notching: This is an operation of cutting ends to facilitate folding of corners.
- (iv) Spot welding : Sheets are spot welded with spot welding machine for joining of sheet metal parts.
- (v) Riveting: Joining of sheet metal parts by riveting is carried out with a riveting machine or by hand riveting.

(vi) AARC

Welding : Joining of metal parts is done with arc welding.

(vii) Blanking &

Punching : Cutting of corners of sheet metal is done with the aid of punches and dies fitted on press.

(viii) Bending : Bending of pipes for the frame work is done on pipe bending machine or pipe bending fixture.

(ix) Drilling : Drilling of holes on pipes and frames are carried out with the help of drilling machine and hand drills.

(x) Pickling : This operation is done to clean the parts with the help of acids, for preparing surface to enable the paint not to chip or peel off after spraying.

(xi) Stove

Enameling: This is done by heating in a oven at a temp. say 150 to 200° C.

(xii) Spray

Painting : Painting of the metallic parts are done with the help of a spray gun and a compressor. Operation Sequence is as follows :—

- (a) Shearing of sheets.
- (b) Bending, forming of sheets.
- (c) Tube bending.
- (d) welding.
- (e) drilling & rivetting.
- (f) Painting & stove enameling.
- (g) Assembly of castor wheels, packing.
- (h) inspection & testing.

IV. Quality, Standards and specifications

In the manufacture of hospital furniture, the quality of the product should conform to Indian standards. In the fabrication of frame work, shapes and dimensions should conform to the relevant specifications.

ISI standards of the following or hospital furniture have to be followed:—

- IS : 4035—1967 Trolley, Stretcher
- IS : 4036—1967 Trolley, Patient
- IS : 4037—1967 Stretcher, and stretcher carriers.
- IS : 4455—1967 Trolleys, Soiled Linen
- IS : 6207—1971 Trolleys, for oxygen cylinders.
- IS : 4267—1967 Stand, wash hand basin.
- IS : 4266—1967 Lockers, bedside.
- IS : 4458—1967 Screws bedside.
- IS : 4494—1967 Tables, over bed.

Tests for hospital furniture items shall be subjected to tests in accordance with the requirement of above specifications.

V. Land & Building (rented) covered area—200 sq. meters	Rs. 500/-
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VI. Machinery and Equipment

1. Guillotine Shearing machine treadle operated. 36" blade and 16 SWG shearing cap . . . one	5,500/-
2. Open ended hand operated cramp folding machine and bending blocks . . . one	2,200/-
3. Pipe bending machine hand operated 1½" cap . . . two	3,500/-
4. Hand operated press brake 10" long . . . one	7,000/-
5. Power press 30 tons cap, column type gear type . . . one	10,000/-
6. Hand Fly Press no.5 . . . one	1,200/-
7. ARC welding set transformer type 250 amps. cap. oil cooled . . . one	5,500/-
8. Gas welding set . . . one	2,500/-
9. Portable spot welder 10 KVA . . . one	7,500/-
10. Double ended bench grinder 10" dia . . . one	
11. Portable electric Drill ½" cap . . . one	
12. Centre lathe 6 ft. bed length Ht. of center 6½" . . . one	22,000/-
13. Spray painting equipment spray gun & compressor 60 PSI cap. . . one	5,000/-
14. Stove enamelling oven, electrically heated for temp. upto 250° C & tanks for pickling, etc. . . one	8,000/-
15. Installation & erection charges.	10,000/-
Total	91,700/-

16. Tools, Dies, Jigs & Fixtures	Rs. 5,00/-
17. Work Benches, Tables, racks, etc.	2,000/-
18. Office equipment and workshop furnitures.	4,000/-
	1,02,700/-

VII. Raw Material and Boughtout Components

1. ERW steel tables conforming to IS : 2039—1964—1" dia. 10,000 sq. ft.	20,000/-
2. M.S. PCRC Sheets—5 tons @ Rs. 4,500/-	22,500/-
3. Aluminium Sheets Grade SIC or N53 (1/2") of IS : 737—1955—1½ ton @ Rs. 18,000/-	9,000/-
4. G.I. Sheets IS : 277—1962 ¼ ton @ Rs. 16,000	4,000/-
5. Canvas variety no. 3—IS : 1425—1959	3,000/-
6. Channels size 80x30mm IS : 811—1965	2,000/-
7. Pole timber—moisture content 12%	1,000/-
8. Castor rubber wheel size HN 50 to HN225 (as per requirement IS 4034—1968).	1,000/-
9. Angle iron & M.S. rounds assorted sizes.	500/-
	63,000/-

(ii) Indirect raw materials

Lubricants, acids, cottonwaste, paints, varnishes, cutting.	300/-
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VIII. Staff and Labour month. 163,300/-

A. Administrative & Supervisory		
Manager	One	700/-
Foreman	One	650/-
Ministerial staff for stores accounts and other allied work.	3	1,200/-
Peon	1	200/-
Watchman	1	220/-
		2,950/-
B. Technical & others		
1. Skilled operators 4 nos. @ 350/-		1,400/-
2. Welding operator 1 no. @ 300/-		300/-
3. Semi skilled workers. 4 nos. @ 250/-		1,000/-
4. Helper 2 nos. — 200/-		400/-
		3,100/-
Staff welfare @ 30 %		1,815/-
		7,865/-

IX. Other Expenses

1. Electricity & water	500/-
2. Maintenance & Repair	100/-
3. Office stationery & postages	200/-
4. Consumable stores	250/-
5. Advertisement & publicity	200/-
6. Transport charges	200/-
7. Taxes	150/-
8. Other miscellaneous	250/-
9. Rent	500/-
	2,350/-

X. Working capital per month

1. Raw materials	Rs. 63,300/-
2. Personnel	7,865/-
3. Other expenses	2,350/-
	<u>73,515/-</u>

XI. Capital Investment

1. Machinery and Equipment	1,02,700/-
2. Working capital for 3 months	2,20,545/-
	<u>3,23,245/-</u>

XII. Cost of production/month

1. Recurring expenses	73,515/-
2. Insurance	300/-
3. Depreciation on m/c @ 10%	860/-
4. Interest on capital investment	2,800/-
	<u>77,475/-</u>

XIII. Sales proceeds/month

By sales —stretchers & stretcher carriers	—100 nos.
Tables overbed	—100 nos.
Trolleys stretcher	—100 nos.
Trolleys—patient	—100 nos.
Trolleys for oxygen cylinder	— 50 nos.
Trolleys—solid linin	— 50 nos.
Screen bed side	—100 nos.
Stand wash basin	—100 nos.
	<u>—700 nos.</u>

Rs. 90,000/-

XIV. Profitability per month

Sales	—Rs. 90,000/-
Cost of production	—Rs. 77,475/-
	<u>Rs. 12,525/-</u>
Percentage of profit on sales	$\frac{12,525 \times 100}{90,000} = 14\%$
Percentage of profit on return : $12,525 \times 12 \times 100$	
	<u>2,23,245</u> Say : 7%

XV. Break even point*Fixed cost.*

Rent	Rs. 500/-
Interest	2,800/-
Insurance	300/-
Depreciation	860/-
40 % of salary	3,140/-
40 % of other expenses	940/-
	<u>8,640/-</u>

Fixed cost x 100

Fixed cost + profit : 8640×100	Say : 40.8%
<u>21,165</u>	

XVI. List of Machinery Suppliers

1. M/s. Perfect Machine Tools,
44E, Connaught Place, New Delhi.
2. M/s. Batliboi & Co.,
Jeevan Vihar,
Parliament Street,
New Delhi.
3. M/s. Maneklal & Sons,
Narayan Dhun Street, Fort, Bombay-1.
4. M/s. Atlas Works Pvt. Ltd.,
Rippon Street, Calcutta.

XVII. Source of Raw Materials

1. M/s. Raunaq Steel Industries Ltd.,
New Delhi.
2. M/s. Tube Investment Inds. Ltd.,
Samson, Madras.
3. M/s. Hindustan Steel Ltd.,
New Delhi.
4. M/s. Hindustan Aluminium Corp. Ltd.,
UCO Bank Building,
Parliament Street, New Delhi-1.
5. M/s. Prenin Irngatia Equipment (P) Ltd.,
P.O. Boral, 24 Parganas,
West Bengal.

(Reserved items Sl. Nos. 406, 407, & 409).

I. Product and its uses :

Due to standard of living going up day by day the demand for durable consumer goods is going up. Tricycles and Perambulators are among those items. These two items are used for the children for their recreation and play. There are many major parts in these items i.e., frame wheels, fork, handles, seat etc. Separate units can be started for the manufacture of main parts as above. This scheme deals with the manufacture of wheels for Tricycles and perambulators, which will be sold to the manufacturers of these items or in the replacement market.

II. Production Targets:

It is proposed to manufacture 5000 wheels per month.

III. Production details and process of manufacture:

The tricycle and perambulator wheels are made out of steel strip rolled into particular U-Section and made into a ring of the size of wheels. Normally the size of wheels is 200×150 mm i.e. to suit the rubber ring of 200 mm O.D. and 150 mm internal dia. The ring is then gas welded and drilled for spoke holes. The hub is made out of pipe pieces and flanges. The flanges are made on the power presses. The spokes are purchased from the other sources. Finally the spokes are put in the hub and rivetted in the wheel ring on a rivetting fixture. The wheels are then straightened on a straightening fixture and then packed for despatch.

IV. Inspection and Quality Control:

The wheels of Tricycle and Perambulators are not very precise items and therefore rigid inspection procedure is not necessary. Only in process inspection of ring size, and run out of the assembled wheels is necessary. There are no I.S.I. Specifications for this item.

V. Land and Building :

Covered area—150 sq. metres (Rented) Rs. 750/-

VI. Machinery and equipment :

All machines are with motor and starter.

		Rs.
1. Power Press—25 Tons cap. with 3 H.P. motor	1 No.	10,000
2. Power Press—10 Tons cap. with 2 H.P. motor	1 No.	6,000

		Rs.
3. Wheel rolling machine with 2 H.P. motor	1 No.	5,000
4. Pipe cutting machine with 1 H.P. motor	1 No.	4,000
5. Drilling machine 1/2 cap with 1.0 H.P. motor	1 No.	2,000
6. Bench grinder motorised with 0.50 H.P. motor	1 No.	1,500
7. Sheet Cutter (hand operated)	1 No.	1,500
8. Painting equipment	Set	2,000
9. Riveting fixture	2 Nos.	1,000
10. Gas Welding Set	1 Set	2,000
11. Dies, Tools & Jigs		2,000
		37,000
12. Installation and electrification		3,700
		40,700
13. Office furniture and equipment		2,300
		43,000
Total		

VII. Raw Material requirements (per month) :

		Rs.
1. M.S. Strip—35 mm wide $\times$ 1.25 mm thick @ 180 gms per pc. for 5000 wheels.	900 Kg.	2,700/-
2. M.S. Strip 1.25 mm thick @ 35 gm. per pc. for 10000 flanges of hubs.	350 kg.	1,050/-
3. M.S. Pipe 22 mm dia and 19 mm dia. 1.5 mm thick for 5000 hubs @ 50 mm long for each size.	500 Mts.	1,000/-
4. Spokes for 5000 wheels, 60,000 Pcs.		3,500/-
		8,250/-

VIII. Staff and labour (per month) :

1. Manager		1	800/-
2. Foreman		1	600/-
3. Skilled Workers		3	900/-
4. Semi Skilled		4	1,000/-
5. Helpers		2	400/-
6. Store keeper cum clerk		1	300/-
7. Welder		1	350/-
8. Chowkidar cum peon.		1	200/-
			4,550/-
Total			

IX. Other Expenses (per month):

	Rs.
1. Electricity and water.	300/-
2. Consumable Tools.	100/-
3. Oils & lubricants.	100/-
4. Calcium carbide.	500/-
5. Postage & Stationery.	150/-
6. Transportation & Cartage.	100/-
7. Packing charges.	500/-
8. Rent.	750/-
9. Unforeseen expenses	200/-
	<u>2,700/-</u>

X. Working Capital required (for 3 months):

1. Raw materials	24,750/-
2. Salaries & Wages	13,650
3. Other expenses	8,100/-
	<u>46,500/-</u>

XI. Total Capital Investment :

1. Total fixed investment on machinery and equipment	43,000/-
2. Working capital for 3 months	46,500/-
	<u>89,500/-</u>
Say	<u>90,000/-</u>

XII. Cost of production (per annum) :

1. Recurring expenses $46,500 \times 4$	1,86,000
2. Interest on total capital @ 15% per annum.	13,500
3. Depreciation on machinery @ 10% per annum	4,300
4. Sales expenses.	5,000
Total	<u>2,08,800</u>
Say	<u>2,09,000</u>

XIII. Sales proceeds (per annum) :

By sale of 60,000 wheels @Rs. 4.00 per wheel without tyre. 2,40,000

XIV. Profitability (per annum) :

Profit = Sales minus cost of production
 $= 2,40,000 - 2,09,000 = 31,000$
 Percentage of profit on sales = 13 %
 Percentage of return on investment = 35 %

XV. Break Even Analysis :

B.E.P. — $\frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost plus profit}}$
 Fixed cost (per annum)

1. Rent	9,000/-
2. Interest on capital	13,500/-
3. Depreciation	4,300/-
4. 40% of salaries	21,850/-
5. 40% of other expenses	12,960/-
Total	<u>61,610/-</u>

B.E.P. = $\frac{61,610 \times 100}{61,610 + 31,000} = 66\%$

XVI. Name and addresses of suppliers of machinery and equipment :

1. M/s. Burma Mechanical Works,
254-Industrial Area 'A',
Ludhiana.
2. M/s. Perfect Machine Tools Co.
(P) Ltd. Bel Building,
Sir P.M. Road, Bombay-1.
3. M/s. Batliboi & Co. (P) Ltd.,
190-A-Forbes Street,
Bombay-1.
4. M/s. Atlas Works (P) Ltd.,
119, Ripon Street.,
Calcutta-16.
5. M/s. Revac Industries (P) Ltd.,
6-7, Shru Nagar,
2-M.G. Road,
Bangalore-1.
6. M/s. Shubh Machinery Corporation,
15, Bank Street,
Bombay-1.

(Reserved items Sl. Nos. 725 & 727).

Introduction

A. Tube cutters and Flanging Tools fall under the category of small tools widely used in Hydraulic tubes and pipes installation. These are mainly used as a hand tool for cutting the tubes to required predetermined length by hand operation and also to flare and form the flanging ends of the tubes to produce nipples and check nuts for proper seating at the Hydraulic connection in preventing the leakage of the fluid.

With the increase in the application of Hydraulic system and Hydraulic controlled machinery and equipments both for the duplication connections and lines. Apart from this, these tools are also used extensively for pipe line cutting to-day and also in the field of machine tool industry and other equipments.

Since both from the point of views for replacement of broken or ruptured in an hydraulic lines, installation, and also for the manufacture of new tailor made Hydraulic lines circuits the plumber or the fitter use these tools for the preparation of the tubular connections.

These tools are very simple in design and in construction.

Tube cutters: The tube cutter consists of a Shank which has two circular knob edged generally of dia 15 mm to 30 mm—one fixed on above the other. One of the cutter is adjustable by the screwed arrangements to adjust according to the dia of the tubes to be cut. The shank has an angle which an operator can adjust in position in between the two cutters to rotate the tool around the tube or pipe both had adjustment made for bring down the cutter until the tube is made cut its full depth. The cutter is made up of HSS or High Carbon Steel. The shank is made out of mild steel and is placed in the dick type roller and cutter is held to be suitably on to the shank.

B. Flanging Tools: It consists of a gripping pin or vice and to the other portion consists of a vertically moving flanging tool with conical ends. The tool is clamped between the gripping in vice and the flanging tool is screwed down to form a flange on the tube ends. These parts are made out of EN 8 material and the shank of the tube may be plated.

These items are machined consisting of turning, drilling and milling operations. The parts are assembled and suitably hand rivetted and also screwed.

There are no ISI standards available and for products which are good with quality design adopted. There is a growing demand for these tools in the market. The scheme is envisaged a production target 3000 sets per annum per shift.

Motive power required—25 HP (Approx).

D. Financial aspects:

(i) Fixed capital:

(a) Land and building—800 sq. meters	Rs.
Rented of covered area.	800/- p.m.

(ii) Machinery & Equipment:

(a) Production unit:

(1) Screw cutting lathe ($\frac{1}{2}$ ' bed 5" with motor and necessary accessories	1 No.	30,000/-
(2) Horizontal milling machine with motor, coolant attachment	1 No.	12,000/-
(3) D.E. Bench grinder	1 No.	1,500/-
(4) Electrical furnace 4' x 4' x 4' upto 1200 Degrees F. with Pyrometer control	1 No.	12,000/-
(5) 10 Ton capacity power press	1 No.	8,000/-
(6) Tool and cutter grinder	1 No.	12,000/-
(7) Hardness tester	1 No.	8,000/-
		<u>1,13,500/-</u>

(b) Electrification and installation expenses at 10% of cost of machinery and equipment	Rs.
	11,000/-

Total cost of machinery & equipment 24,500/-

(iii) Cost of tools dies etc 5,500/-

(iv) Cost of office equipment 1,500/-

(v) Pre-operative expenses 5,000/-

Total fixed capital 1,36,500/-

II. Working Capital (per month)

1. Personnel:

(a) Administrative & Supervisory:	Rs.
1. Manager/Foreman	1 No. 600/-
2. Accountant	1 No. 500/-
3. Clerk/typist	1 No. 400/-
4. Store keeper	1 No. 500/-
	<u>2,009</u>

	Rs.
(b) 1. Skilled workers 4	1,000/-
2. Semi skilled] 2	300/-
3. Helper 2	200/-
4. Watchman/jeon 1	100/-
Total salaries Rs. 3,600/-	1,600/-

(ii) Raw materials (per month)

	Rs.
(a) Ensteel No. 8 1 ton.	1,500/-
(b) High carbon steel High chromium steel (oil hardened) 100 Kgs	3,200/-
	7,700/-

(iii) Utilities per month :

	Rs.
Power 25 HP	300/-
Water 20,000 ltrs	(approx.) 20/-

(iv) Other contingent expenses per month :

	Rs.
Rent.	800/-
Postage/stationery	50/-
Telephone	200/-
Consumable stores such as cotton waste quenching oil, greese etc	250/-
Transportation	150/-
Advertisement/publicity	150/-
Insurance	50/-
	1,650/-

(v) Total recurring expenditure (per month)

Staff and labour	3,600/-
Raw materials	7,700/-
Other expenses	1,650/-
	12,950/-

Total working capital/3 months Rs. 38,850/-

III. Total capital investment

1. Fixed capital	38,850/-
2. Washing Capital	
	1,75,350/-

IV. Cost of production/year

	Rs.
1. Total recurring cost/year	1,55,400/-
2. Depreciation on machinery & Equip.	13,650/-
3. Int. on total capital at 15 % PA	26,250/-
	1,95,300/-

V. Turnover per year

	Rs.
By sale of 3000 sets of flanging tools/ tube cutters at Rs. 75/- set.	2,25,300/-
6. Net profit per year.	28,700/-

7. Break even point :

In terms of quantity	Fixed cost
	Sales—variable cost
	=2600 sets
Break even point in value	19,500/-

VIII. Additional information

These tools are consumable and are having continuous demand in the market. There is not much competition prevails in this line of activity. However, the demand for these products is entirely depends on the quality of the products and the materials are used.

Since the equipments are mentioned in the projects are general type, it will be better for the unit to have multiproducts, for the items which are having good se%e.

IX. Addresses of machinery suppliers :

1. M/s. Hindustan Machinery Corporation
Unity Building, J.C. Road,
Bangalore-560002.
2. Ms/. Quality Machine Tools
V.V. Puram,
Bangalore-56002.
3. M/s. Indian Furnace Co. Ltd.,
Lotus Cinema Building,
12-A, Dr. Annie Basent Road,
Bombay-18.
4. M/s. Singhal Engg. Works,
Babu Marg,
Aligarh.
5. M/s. Fuel Instruments & Engineers (P) Ltd.,
Ichalkaranj,
(Maharashtra).

(Reserved items Sl. Nos. 672 & 673).

I. Product and its uses

(a) The tyre inflators are utilised for air filling in tubes of automobile vehicles and bicycles. Since in rural areas and during transit, air filling facilities are not available, the tyre inflators are of much use.

(b) Market Potential

Due to low cost and modernization of agricultural process, animal driven carts fitted with rubber tubes and tyres are used in rural areas. Similarly bicycles and motor cycles are also in use in villages. In all such places the air filling has to be done by air inflators. Hence the product has good demand.

II. Production Target

It is proposed to manufacture 1000 Nos. tyre inflators per month.

III. Production details and process of manufacture

In order to keep cost on lower side, it is proposed to purchase cast iron castings, nuts, washers and wooden handles from out side. Steel tubes are cut to size and threading is done on special fixtures. Mild steel rods are turned on lathes and threading is done to fit bottom and top. Top and bottom are machined on the lathes.

IV. Inspection and Quality Control

To produce good quality tyre inflators, the raw materials should be used of good quality. The leather washer is very important part and it should be made from good quality leather. Similarly the plastic tube and its clamps should be purchased from reputed manufacturers.

V. Land and Building.

	Rs.
100 sq. metre covered area Rented	500·00

VI. Machinery and Equipment.

1. Lathe 4' bed size.	4 Nos.	20,000·00
2. Drill machine 3'/4".	2 Nos.	4,000·00
3. Threading machine.	2 Nos.	1,000·00
4. Hand press.	1 No.	1,000·00
5. Metal cutting circular saw.	1 No.	2,000·00
6. Grinder 8" dia.	1 No.	1,000·00
7. Workshop tools, measuring instruments etc.		2,500·00
8. Installation and electrification.		2,500·00
9. Office furniture and equipments.		1,000·00
		<u>35,000·00</u>

VII. Raw Material Requirements (Per month).

	Rs.
1. Steel tubes 30mm dia. 425 Kgs @ Rs. 4/- per K.G.	1,700·00
2. C.I. Castings, 200 Kgs @ Rs. 2·50 p. kg.	500·00
3. Steel bar 10 mm dia. 380 Kgs @ Rs. 1500/- per ton.	570·00
4. M.S. Nuts 10 mm size' 530 Kgs @ Rs. 9/- per KG.	450·00
5. Leather washer 1000 Nos. @ 45 paise per piece.	450·00
6. M.S. Washer 20 Kgs @ Rs. 6/- per Kg.	120·00
7. Wooden handle 1000 Nos. @ 80 paise per piece.	800·00
8. Rubber pressure pipe 1000 metres @ Rs. 2/- per metre.	2,000·00
9. Clams and springs, 1000 sets.	1,000·00
10. Leg support, etc.	4,000·00
	<u>11,590·00</u>

VIII. Staff and Labour (Per month).

	Rs.
1. Manager. 1 No.	800·00
2. Clerk-cum-Accountant. 1 No.	350·00
3. Skilled worker. 4 Nos.	1,600·00
4. Semi-skilled worker. 2 Nos.	600·00
5. Unskilled worker. 2 Nos.	400·00
6. Cost of labour benefit.	550·00
	<u>4,300·00</u>

IX. Other Expenses (Per month).

	Rs.
1. Rent.	500·00
2. Electricity and water.	300·00
3. Consumable tools.	100·00
4. Oil and lubricants.	100·00
5. Publicity expenses.	200·00
6. Travelling expenses.	200·00
7. Miscellaneous.	600·00
	<u>2,000·00</u>

X. Working Capital Required (Per month).

	Rs.
1. Raw material.	11,590·00
2. Staff and labour.	4,300·00
3. Other expenses.	2,000·00
	<u>17,890·00</u>

XI. Total Capital Investment.

	Rs.
1. Machinery and Equipments.	35,000·00
2. Working capital for 3 months.	53,670·00
	<u>88,670·00</u>

XII. Cost of Production (Per Annum).

Rs.

1. Raw material.	1,39,080·00
2. Salaries.	51,600·00
3. Other expenses.	24,000·00
4. Interest on capital @ 15 %	13,300·00
5. Depreciation on machinery @10 %	3,500·00
	<u>2,31,480·00</u>

XIII. Total Sales (Per Annum).

By sale of 12,000 Nos. tyre inflators @ Rs. 21/- per piece.	Rs. 2,52,000 00
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XIV. Profitability (Per Annum).

Total sales—Cost of production	= Profit
Rs. 2,52,000—Rs. 2,31,480	= Rs. 20,520·00]

$$(a) \text{ Percentage of profit on sale } = \frac{20520 \times 100}{252000} = 8 \%$$

$$(b) \text{ Percentage of profit over investment. } = \frac{20520 \times 100}{88670} = 23 \%$$

XV. Break Even Analysis.

$$B.P. = \frac{\text{Annual fixed cost} \times 100}{(\text{Fixed cost} + \text{Profit})}$$

Fixed cost (Per Annum).

Rs.

1. Rent.	6,000·00
2. Interest.	1,33,00·00
3. Depreciation on machinery.	3,500·00
4. 40 % of salaries.	20,640·00
5. 40 % of other expenses.	7,200·00

50,640·00

$$B.E.P. = \frac{50,640 \times 100}{(50,640 + 20,520)} = 71 \%$$

XVI. Addresses of Machinery Suppliers.

1. M/s. Anil Engineering Wokrs.
Malaviya Road, Rajkot (Guj.)
2. M/s. Batliboi & Co.
Post Box No. 190-A, V.B. Gandhi Marg,
Bombay-400023.
3. M/s. Perfect Machine Tools Co. Ltd.,
Bell Building, Sir P.M. Road, Fort,
Bombay-1.

(Reserved item Sl. No. 679).

I. (a) Product and its uses

There are different types of umbrellas used by gents, ladies and children. Umbrellas are very commonly used in our country because of the different climates to protect against sun and rain.

(b) Market Potential

The demand for umbrellas depends upon climatic conditions, increase in population, general increase in income, change in social outlook and customs and export possibilities of umbrellas.

Delhi is the main market for umbrellas in Northern India. According to the market reports the total off-take from Delhi market is estimated to be worth Rs. 1 crore. 10 per cent of the total off-take is consumed in Delhi itself. Keeping in view the above mentioned factors the demand for umbrellas is expected to increase by 7 per cent to 10 per cent during the next five years.

According to the import policy, import of umbrellas is banned.

There are good chances of export. Umbrellas were exported in 1975-76 worth Rs. 7.44 lakhs and its fittings were exported worth Rs. 11.3 lakhs. During the year 1976-77 umbrellas were exported worth Rs. 32.70 lakhs and its fittings worth Rs. 22.76. Umbrellas were exported to Nepal, Sri Lanka, Yemen, United Arab Republic, Ethiopia, Malavia, Nigeria, Tanzania, Uganda, Fiji etc.

II. Production Target (Per Annum)

This scheme envisages for the manufacture of 15000 umbrellas (worth Rs. 4,57,500) per annum on single shift basis.

III. Product details and process of manufacture

The product is based on IS-2920-1961. The various parts are procured from outside. The cloth is cut to the size by use of a profile and stitched on serving machines. All parts like Ribs, Handles, Cloth, Brass rings M.S. pipes etc. are assembled together.

IV. Inspection and Quality Control

This scheme envisages for the manufacture of Umbrellas based on IS-2920-1961.

V. Financial Aspects

(1) Fixed Capital

(i) Land and Building :

Total covered area 200 sq. meter rent	Rs.
@ Rs. 10/- per sq. meter (Rented)	2,000.00

(ii) Machinery and Equipment :

Sl. No.	Description	Qty.	Price
			(Rs.)
1.	Sewing machine	4 Nos.	1,600.00
2.	Hand tools		1,000.00
3.	Testing equipment		1,000.00
			3,600.00
	Electrification & Installation charges @ 10% on the total cost of machine		Nil
	Work table, stools, and office furniture		10,000.00
			13,600.00

(2) Working Capital :

(i) Personnel :

1.	Supervisor	1	750.00
2.	Clerk	1	300.00
3.	Chowkidar	1	200.00

Technical—Sikilled and Unskilled

1.	Skilled workers	3	1,200.00
2.	Semi-skilled workers	8	2,000.00

Total (salaries) 4,450.00

(+) Perquisites @ 15% of salaries 675.00

Total 5,125.00

(ii) Raw Materials (Per Month) :

S. No.	Particulars	Indigenous/ Imported	Qty.	Rate (Rs.)	Value
					Rs.
1.	Cloth	Indigenous	1875 meters	6.00	11,250.00
2.	Umbrella ribs (painted)	"	10000 Nos.	0.50	5,000.00
3.	Brassring	"	1250	0.25	312.00
4.	Seamless M.S. Pipe (painted)	"	1250	1.50	1,875.00
5.	Plastic handles	"	1250	2.00	2,500.00
6.	Spring & Clips	"	1250	0.15	187.00
7.	Clotted cap pipe	"	1250	0.30	375.00
8.	Thread spools	"	250 rolls	1.50	375.00
9.	Elastic tapes	"	200 mtr.	3.00	600.00
					22,474.00

i(ii) *Utilites (Per month)*

	Rs.
Power	120·00
Water	100·00
	<u>220·00</u>

(iv) *Overhead charges (Per Month)*

	Rs.
1. Rent	2,000·00
2. Postage and stationery	100·00
3. Taxes	100·00
4. Telephone	200·00
5. Consumable store	100·00
6. Insurance	100·00
7. Transport charges	200·00
8. Sales expenses	600·00
9. Advertisement	200·00
10. Misc.	200·00
	<u>3,800·00</u>

(v) *Total Working Capital (Per Month)*

	Rs.
1. Personnel	5,125·00
2. Raw materials	22,474·00
3. Utilities	220·00
4. Overhead charges	3,800·00
	<u>31,619·00</u>
Say	<u>31,620·00</u>

(vi) *Total working Capital for 3 months* 94,857·00

3. *Total Capital Investment*

	Rs.
(i) Fixed Capital	13,600·00
(ii) Working Capital for 3 months	94,857·00
	<u>1,08,457·00</u>

4. *Cost of Production (Per year)*

	Rs.
1. Total recurring cost per year	3,79,428·00
2. Dep. on machinery & equipment @10%	360·00
3. Dep. on furniture @20%	2,000·00
4. Interest on investment @15%	16,267·00
	<u>3,98,055·00</u>

5. *Turnover (Per year)*

15000 Umbrellas @Rs. 30·50 each	4,57,500·00
6. Net Profit (Before taxation)	59,445·00
7. Net profit ratio	12%
8. Rate of return	54%
9. Breakeven point	48%

Addresses of Suppliers :

Umbrella Ribs :

1. M/s. Jayashree Umbrella Co.,
Opp. to CCB Fancy Bazaar , Gauhati.

2. M/s. Mahendralal Dutta & Co.,
Mahatma Gandhi Road, Gauhati.

Addresses of Suppliers of Sewing Machine

Machinery 1. M/s. Sansar Sewing Machine
G.T. Road, Shahdara

Components 2. M/s. Rita Sewing Mech. Industry
Industrial Area, Ludhiana.

3. M/s. Pareser Mech. Works.
Indl. Area, Ludhiana,
Also available in market.

(Reserved item Sl. No. 784)

I. Product and its uses

The tappet or valve lifter is held between guides which are generally part of the engine block. Its faces contact the cam of the cam shaft and its upper end adjustable in length with adjusting screw is just beneath the bottom of the valve stem. When the cam rotates it lifts the tappet which lifts the valve to the open position, connecting the valve part with the combustion chamber. Also non-adjustable type of tappets are used. In such case, the clearance can be decreased by grinding the valve face and valve seat for maintaining valve tappet clearance. Some valve-lifters are Hydraulic valve lifters and this valve-operating mechanism automatically adjusts its length to compensate for difference in valve tappet clearance. The tappet body contains the cylinder and the oil reservoir.

As an original and replacement item, this will find a good market for Automobiles, Tractors and Marine Engines.

II. Basis and Presumptions

The scheme is based on Tappets or valve lifter adjustable type with provision for screw and plain types only. Hot forged blanks may be sub-contracted out as it will be un-economical to have a forging section for this size of a unit envisaged in the profile. So also, heat treatment may be given outside.

III. Production details and process of manufacture

(i) Process outline

1. The blank rods are cropped to required size.
2. Hot forged to form the head seating.
3. Forged blanks are turned and faced drill hole, and Tap thread of screw adjuster.
4. Heat treatment of valve lifter.
5. Cylindrical grinding and face grinding.
6. Assembly of screw and packing.

IV. Quality Control and Standards

The Indian Standards has laid down specification for inlet and exhaust tappet valve for IC engines and No. 18810-1987 may be referred.

(ii) Production capacity (Per annum)

(a) Quantity	Rs.
(b) Value	1,12,000 Nos.
	Rs. 6,00,000/-

(iii) Motive Power (Requirement of HP) Approximately 25 HP.

V. Land and Building (Built up Area rented—

60' x 40' = 2400 sq. ft.)

VI. Machinery Equipment

Sl. No.	Article	Qty. (Nos.)	Amount
			Rs.
1.	Precision capstan lathe 35mm bar capacity Chucking type, Gee-Dee Wieler or Peremat or similar	1	28,000.00
2.	Precision centre lathe 4½" Ht. of Centre Length of bed—3ft. Gee-Dee Wieler or similar	2	50,000.00
3.	Universal cylindrical grinding machine M x grinding length 400mm Ht of centre 125 mm M x grinding Dia 100 mm complete with motor and coolant pump Paragaon or similar	1	35,000.00
4.	Second operation facing lathe. Ht. of centre 4½", length of bed 3' Gee-Dee Wieler or similar	1	20,000.00
5.	Remit-Tapping machine—Tapping in steel 5/8" Model M-19 or similar	1	9,000.00
6.	Double end Bench grinder wheel dia 8"	1	1,800.00
7.	Hand tools measuring instruments Handi master etc, (lumpsum)	—	25,000.00
8.	Work benches, office equipment tables etc.		6,000.00
9.	Erection and installation charges		10,000.00
	Total		1,84,800.00

VII. Raw Material (Per month)

EN 36 steel, nickel chrome steel rods, forged blanks 2 M Ton @Rs. 10,000	Rs.
ENI—A rods 8 mm dia for screws 0.25 M ton @Rs. 9,000/-	20,000.00
	2,250.00
	22,250.00

Utilities (Per month)

Power and water charges	Rs.
	300.00

VIII. Staff and Labour (Per month)

(i) Personnel

Administrative and Supervisory	Rs.
1. Manager	900.00
2. Supervisor	650.00
3. Store-keeper-cum-clerk	400.00
4. Inspector	400.00
	2,350.00

Technical-Skilled and Unskilled

1. Skilled workers	5	2,000.00
2. Semi skilled operators	two	600.00
3. Helpers	two	300.00
4. Watchman	one	150.00

Total salaries	3,050.00
+ Perquisites @ 15% of salaries	5,400.00
	800.00

TOTAL 6,200.00

IX. Other Contingent Expenses (Per Month)

	Rs.
Power and water charges	300.00
Rent	600.00
Postage & Stationery	300.00
Telephone	250.00
Consumable stores such as oils, coolants, taps drills, cutting tools, grinding wheels, etc.	4,000.00
Repairs & maintenance	300.00
Transport charges	350.00
Advertisement & Publicity	300.00
Insurance	200.00
Taxes	200.00
Selling expenses	300.00
Miscellaneous expenses such as heat treatment charges etc.	2,000.00
Total	8,800.00

X. Expenses

	Rs.
(a) Total recurring expenses (per month)	2,100.00
(b) Total working capital (on 3 months basis)	1,12,650.00

XI. Total Capital Investment

(a) Fixed Capital	1,84,800.00
(b) Working Capital	1,12,650.00
Total	2,97,450.00

XII. Cost of Production (Per Year)

	Rs.
Total recurring cost per year	4,50,600.00
Depreciation on machinery & equipment @ 10%	18,480.00
Interest on Total investment @ 15%	44,620.00
Total	5,13,700.00

XIII. Sales Proceeds

Item	Qty.	Rate	Value
Inlet tappets for different engines	60,000 Nos.	5/- per pc.	3,00,000.00
Exhaust tappets for different engines	60,000 Nos.	5/- per pc.	3,00,000.00
Total			6,00,000.00

XIV. Profitability

Profit per year (before taxes)	Sales	Rs.	6,00,000.00
Cost of Production		(—)	5,18,700.00
Profit			86,300

Profit Ratio

Percentage of Profit on sales =
Profit per year × 100

Turn over per year
85,300 × 100

6,97,450
= 14.8%

Percentage of return
Profit per year × 100

Total investment
86,300 × 100

2,97,450
= Approx. 27%

XV. Break Even Analysis

Break-even point (%age of total production envisaged)

(i) Fixed Cost

	Rs.
(a) Depreciation on machinery and equipment	18,480.00
(b) Rent on Building	7,200.00
(c) Interest on total investment	44,620.00
(d) Insurance	2,400.00
(e) 40% salary & wages	29,720.00
(f) 40% of other contingent Expenses (exclud- ing rent & Insurance)	38,400.00
Total	1,30,820.00

Break Even Point % = $\frac{FC \times 100}{FC + P}$
 $\frac{1,30,820 \times 100}{1,30,820 + 86,300}$
 $= \frac{1,30,820 \times 100}{2,17,120}$
 $= 60.2\%$

XVI. Addresses of Machinery Suppliers

1. M/s. Voltas Ltd. ;
Kasturba Road,
BANGALORE.
2. M/s. Perfect Machine Tools,
6, Bell Building,
Sir, PM Road,
BOMBAY-1.
3. M/s. Batliboi & Co.,
40, Forbes Street,
Fort, BOMBAY.
4. M/s. Quality Machine Tools,
VV Puram,
BANGALORE-4.
5. M/s. Bikhu Engineering Corp.,
630/10, Janta Nagar,
LUDHIANA-3.
6. M/s. Leading Engineering Works ;
31, Rohtak Road,
NEW DELHI.
7. M/s. Smithsons Engineering Products,
C-49, Industrial Area,
JULLUNDUR.

Addresses of Material Suppliers

1. M/s. Hindustan Steel Ltd.,
CALCUTTA.
2. M/s. Visveswaraiyah Iron & Steel Ltd ;
BHADRAVATHI.

NOTE :

THIS LINE OF INDUSTRY DOES NOT INVOLVE HIGH SKILL AND THE PRODUCT MIX OF DIFFERENT VALVE LIFTERS IN BATCH QUANTITIES WILL BE ECONOMICAL TO TAKE UP UNDER THIS SCHEME.

(Reserved item Sl. No. 674)



I. Product and its uses

(a) Wall clocks are a common product known to everybody. Wall clocks are mainly of four types (1) Pendulum type, (winding) (2) Lever type winding (3) Transistorised (battery operated) and (4) Electric power operated. Another category may be mini wall clocks.

(b) Market Potential

Wall clocks get almost third place in order of preference so far as individual requirement is concerned, the first being a wrist watch and third a time piece. Time pieces has the specific advantage of having alarm facility. In case of institutional demand such as, schools, colleges, hospitals, factories, shops, offices, etc. the preference and the requirement is for wall clocks alone. Therefore, the demand for wall clocks as individual requirement or home consumption is growing with the rise of urban and semi-urban population and their living standard.

II. Production Targets

It is proposed to manufacture 30,000 wall clocks per annum.

III. Production Details and process of manufacture.

Wall clock mainly consists of clock mechanism and wooden case and glass, etc. Once the design is finalised, the manufacturing drawings are prepared and specifications of materials are laid down. The various parts are manufactured on lathes, automatic machines, presses, gear hobbors, etc. Electroplating on certain parts is carried out. In this scheme, it is proposed to purchase a number of parts from ancillary units.

IV. Inspection and Quality control.

All raw materials and parts purchased should be inspected against standard drawings and specifications. The parts manufactured in own workshop have to be inspected with the help of instruments and gauges. Finally, the clock must be tested for its time accuracy.

V. Land and Building

Covered area 500 sq. metres. Rented P. M. Rs. 2,500.00

VI. Machinery and Equipments.

	Rs.
1. Geared lathe 4' size 6 Nos.	72,000.00
2. Milling machine 1 No.	20,000.00
3. Threading machine 1 No.	1,000.00
4. Drilling machine 1/2" cap. 2 Nos.	4,000.00
5. Automatic pinion hole drilling machine 1 No.	20,000.00
6. Small gear hobber 1 No.	60,000.00
7. Automat (15mm) 2 Nos.	1,30,000.00
8. Power press 25 ton cap. 2 Nos.	32,000.00
9. Hand Presses 8 Nos.	8,000.00
10. Shearing machine 1 No.	15,000.00
11. Slotting machine 1 No.	2,000.00
12. Jig, Fixture, Dies, tool, etc.	50,000.00
13. Installation and electric fittings	50,000.00
14. Office furniture and equipments	2,000.00
	4,66,000.00

VII. Raw Material Requirements (Per Month).

	Rs.
1. Lead brass sheet, 18 gauge & 22 gauge x 4" x 1" for movement casing, 14 ton @ Rs. 40/- per Kg.	56,000.00
2. Lead brass sheets for gears 18 G & 20 G @ Rs. 40/- per Kg.	
3. Bright bar 0.25" & 6mm, 250 Kgs @ 10/- per Kg.	2,500.00
4. Bright bar 1/8" x 3/32" dia. 200 Kgs. @ Rs. 14/- per Kg.	2,800.00
5. Hardened and tempered steel round 1-2.5 Kg. 1mm dia @ Rs. 22/- per Kg.	55.00
6. C. R. sheets 26 gauge, 100 Kgs. @ Rs. 5000/- p. ton.	500.00
7. High carbon spring steel round edge 1 ton, @ Rs. 2400/- per ton imported, size 0.42mm x 19mm.	24,000.00
8. G. I. sheet, 20 gauge, 100 Kgs. @ Rs. 8000/- per ton.	800.00
9. Brass rods 5/16", 8mm, 3/16" and 7/16" 250 Kgs @ Rs. 30/- per Kg	7,500.00
10. Brass nuts, 100 gross	300.00
11. Wooden cabinet, 2500 Nos. @ 10/- per pc.	25,000.00
12. Hands, 2500 sets, @ 2/- per set	5,000.00
13. Dial, 2500 Nos. @ 4/- per piece	10,000.00
14. Packing boxes, 2500 Nos. @ 3/- per pc.	7,500.00
15. Winding key, 2500 Nos. @ 50 paise/pc.	1,250.00
16. Electroplating job work 2500 Nos. @ Rs. 1/- per pc.	2,500.00
	1,45,705.00
	SAY 1,46,000.00

VIII. Staff and Labour (Per Month)

1. Manager	1 No.	1,000.00
2. Supervisor	2 Nos.	1,000.00
3. Skilled workers	15 Nos.	6,000.00
4. Unskilled workers	30 Nos.	6,000.00
5. Cost of labour benefit		3,000.00
		<u>17,000.00</u>

IX. Other Expenses (Per month)

	Rs.
1. Rent	2,500.00
2. Electricity and water	500.00
3. Oil and lubricant	200.00
4. Consumable tools, dies, etc.	600.00
5. Publicity expenses	500.00
6. Travelling expenses, etc.	200.00
7. Stationery, postage, etc.	500.00
	<u>5,000.00</u>

X. Working Capital (Per month)

	Rs.
1. Raw material	1,46,000.00
2. Staff and Labour	17,000.00
3. Other expenses	5,000.00
	<u>1,68,000.00</u>

XI. Total Capital Investment

1. Machinery and equipment	4,66,000.00
2. Working capital for 3 months	5,04,000.00
	<u>9,70,000.00</u>

XII. Cost of Production (Per Annum)

1. Raw material	17,52,000.00
2. Staff and labour	2,04,000.00
3. Other expenses	6,000.00
4. Interest on capital @ 15%	1,45,500.00
5. Depreciation on machinery @ 10%	46,600.00
	<u>22,08,100.00</u>
SAY	<u>22,00,000.00</u>

XIII. Total Sale (Per Annum)

(a) By sale of 30,000 pieces of clocks @ Rs. 80/- per piece	24,00,000.00
(b) by Sale of brass scrap	1,20,000.00
	<u>25,20,000.00</u>

XIV. Profitability (Per Annum)

Total sale—Cost of Production=Profit
Rs. 25,20,000—Rs. 22,00,000 =Rs. 3,20,000.00

(a) Percentage of profit on sale
 $= \frac{3,20,000}{25,20,000} \times 100$

$= 13\%$

(b) Percentage of profit over investment.

$= \frac{3,20,000}{9,70,000} \times 100$
 $= 33\%$

Break Even Analysis

Annual fixed cost $\times 100$

B.E.P. = $\frac{\text{Fixed cost}}{\text{Profit}}$

Fixed cost (Per annum)

	Rs.
1. Rent	30,000.00
2. Interest	1,45,500.00
3. Depreciation on machinery	46,600.00
4. 40% salaries	81,600.00
5. 40% other expenses.	12,000.00
	<u>3,15,700.00</u>
SAY	<u>3,16,000.00</u>

$3,16,000 \times 100$

B.E.P. = $\frac{3,16,000}{(316,000 + 32,00,000)} = 50\%$ approx.

XVI. Name and Addresses of Machinery Suppliers.

1. M/s. Quatech Engineering Works, Lab Road, Morvi, Dist. Rajkot. Gujarat.	Auto pinion hole drilling machine and small gear hobber.
2. M/s Anil Engineering Works, Malaviya Road, Rajkot-2 (Guj.)	Lathe machine.
3. M/s. Batliboi & Co. Forbes Street, Bombay-1.	Lathe machine.
4. M/s. Perfect Machine Tools(P) Ltd. Bell Building, Sir P. M. Road, Fort, Bombay-1.	Automats, Shearing machine.
5. M/s. Shailesh Machine Tools, 18, Bhaktinagar Station Plot, Rajkot. (Guj.)	Power Press and hand presses.

(Reserved in Sl. No. 781)

A. Introduction

The aesthetic influence on dial design has a powerful influence in the watches market. Any study of the modern dial must begin by a brief description of the main processes of manufacture at the disposal of designs to watch manufacturers and retailers.

1. Gold applique (2) stamped relief (3) soldered relief or soldered applique (4) Overlay (5) Transfer

1. Gold applique is a method ensuring an excellent quality for the finished dials whose differing bases and Variety of signs make for valuable combinations. With this in view the dial after gilding or silvering is finished with sun or vertical brushing, satin finish etc, on to this plate already pierced with holes are rivetted 18 cts gold signs, highly polished by diamond lapping and are used on watches of the highest standing.

2. The stamped relief technique is used for watches manufactured on economical basis. The model drawn on a steel block is engraved in relief to create on "original" which is then hardened and pressed down so as to reproduce the model in recess. The brass strip from which the dial is made is cut out and stamped on this die under very high pressure. The material penetrates into the sunken signs. So that the original hour markings are recreated.

The faceting of signs is carried out as for other techniques and the addition of colour on to the top of the signs completes the operation.

3. Soldered relief or soldered applique

Recently introduced in the market has both aesthetic and commercial advantages. This technique is a synthesis of gold applique and stamped relief. Since the preparation of the plates is carried out separately as for gold applique an infinite variety of bases become possible.

The hour markings are soldered to the finished plate. The sides of the metal signs are the same colour as the top.

4. Overlay or the sunk lapping technique: is a very economical process. It consists in diamond lapping directly on the dial plate. The

varieties types of models which have undergone this process are necessarily limited. It is employed in connection with the transfer method or with gold applique.

5. Transfer is the oldest and simplest method in dial manufacture. Today it is limited to the tracing of minute and other markings with titanium.

(B) Basis and Presumption

It is based on the manufacture of Satin finish, sunray finish, Eradium filled, dials of stamped relief and transfer type design of simple dials.

(C) Technical Aspects

(i) Process outline:

The process of dial manufacture consists basically (1) Blanking (2) Soldering the feet (3) recessing (4) preparing the surface for coating (decreasing and etching) (5) Silvering white (6) Alloy gilding (Pink) or black (Oxidation or black nickel plating), (7) Varnishing (8) Printing (9) Drying.

The figures are printed by using prints ink or Luminus paste or embossed in dies (raised figure) faceted with diamond tools.

The dial face is ground and polished by felt dies charged with emery paste or grain size 280-320 and with chromium oxide paste.

Dials are washed in Benzene bath and is then subjected to silvering. Silver plating is preceded by electrolyte degreasing, Washing in very hot and cold water and brushing of the face.

Varnishing is a critical operation and the thickness must be 5-6 and must be colourless. The dials are dried before lacquering by consecutive dippings in three action baths and are then varnished in centrifuge and dried at 40°-45°C in a glass cup board in order to prevent dust from setting on them. Figures are printed on the dials, using press and India rubber cylinders. Raised figures are embossed in one stroke on knuckle or functional press.

After embossing dials are annealed, etched and trimmed on the outer counton. The figures are 0.25 to 0.35 mm length.

(ii) *Production Capacity*

(a) Quantity :	Satin finish Sunray finish Radium filled Transfer type stamped relief dieals for watches	3.5 lakhs pieces
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(b) Value Rs. 10,50,000/-

(iv) Motive Power (Requirement) 50 H.P.

D. Financial Aspects.

(1) Fixed capital :

(i) Land & Building : (Built up area) (4000/- sq. ft.
(40' × 100)

(ii) Machinery & Equipment :

S. No.	Particulars	Qty.	Value
1.	Friction screw press 100 tons.	1	Rs 60,000.00
2.	Eccentric power press 6 tons capacity complete with automatic feed.	1	25,000.00
3.	Hand press. Stroke length 100mm hand wheel operated-No. 4	1	5,000.00
4.	Diamond tool index cutting faceting machine with vacuum compressor etc.	1	65,000.00
5.	Dial feet staking machine for staking & welding ± .01mm.	1	1,70,000.00
6.	High precision. Bench lathe "Deem" model accuracy 10	1	10,000.00
7.	Process camera 38 cm focal length 4 horexposure. Per reduction. Complete with vacuum frame with counter for 12" × 12" frame.	1	55,000.00
8.	Hand printing machine with 360° revolving.	4 Nos.	20,000.00
9.	Hot oven 80°C air tight with 6 or 7 carrous.	2 Nos.	25,000.00
10.	Continuous belt conveyer annealing furnace with Protected atmosphere temp 1150°C.	1 No.	1,85,000.00
11.	MAIER Radium equipment for fitting radium on dials.	1 No.	25,000.00
12.	Emery honing machine complete with Slurry pump and spraying gun	1 No.	25,000.00
13.	Bicromate honing machine complete with slurry pump and spraying gun.	1 No.	25,000.00
14.	Sun ray finishing machine rpm 2000	1 No.	6,000.00
15.	Rectifier 0 to 100 amps 50 V single phase selenium type	1 No.	11,000.00

S. No	Particulars	Qty.	Value
16.	Fibre glass PVC tank 3mm thick Enamel tank 50mm cap.	12 Nos.	Rs. 7,500.00
17.	Purewater equipment 1m. Ohm water resistance 1000lib/min	1 No.	6,000.00
18.	Phmeter, profile projects 300 times to 14 range 1 accuracy 0-1 accuracy	1 No.	25,000.00
19.	Centrifugal drier 1400 rpm 80°C	1 No.	5,000.00
20.	Spray compressor and gun for water circulation pump 7" × 4'	1 No.	11,000.00
21.	Ultrasonic cleaner 10 kg 2 water sq. in.	1 No.	55,000.00
22.	Buffing machine 1800 rp	1 No.	2,500.00
23.	Hot plate 2 kw cap. silica heater 1.5 kw 1 ft. length	1 No.	800.00
24.	Compressor 100cft kg 1 sq.	1 No.	30,000.00
25.	Vacuum pump		5,000.00
26.	Special purpose machine for satin mat finish	1 No.	65,000.00
27.	Hand tools. work benches, office equipment etc.		20,000.00
28.	Erection & installation charges		30,000.00
			9,69,800.00
(iii) Cost of blanking, piercing and coining dies.			80,000.00
			10,49,800.00

2. Working Capital (per month)

(i) Personnel

(a) Administrative & Supervisory

1. Manager	1 No.	850
2. Engineer	1 No.	1,300.00
3. Inspector	1 No.	550.00
4. Supervisor (Plating and finishing)	1 No.	650.00
5. Storekeeper cum clerk	1 No.	400.00
		3,750.00

(b) Technical—Skilled & Unskilled

1. Skilled workers	7 Nos.	3,600.00
2. Semi skilled workers	4 Nos.	1,200.00
3. Helpers	4 Nos.	800.00
4. Watchman	1 No.	200.00

+ Other perquisite @ 15% of salaries

5,800.00
1,550.00
7,350.00

(ii) Raw Materials (Per month)

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Particulars	Imported./ Indi- genous	Qty.	Rate	Value
1. 65/35 cold-rolled brass 0.5 x 35 x coils	Indigenou	175 Kg. @	Rs. 40 per Kg.	Rs. 70000.00
2. Dial foot copper wire 0.75 m. x 2600	Imported	60,000 @	5 paise piece	3000.00
3. Titrum Compound	Imported.	50 gms.		2400.00
4. Printing ink JBA	Indigenous	5 Kg. @	Rs. 10/- Kg.	50.00
5. Spatula blade, shaping shine, acetone and photographic chemicals				1000.00
6. Potassium silver cya- nide				1000.00
7. Nickel sulphate, Nickel chloride, boric acid	5 Kg. @	Rs. 200/-		1000.00
8. Bicromate	200 Kg. @	Rs. 20/-		4000.00
9. Emery (Aluminium oxide 600 mesh)				250.00
10. Lacquer	150 Kg. @	12/-		1800.00
11. Thinner				2000.00
12. Trichlorethelane				250.00
13. Buffing compound				100.00
14. Potassium gold cyanide				4000.00
				2,7850.00

(iii) Utilities (per month)

Power and water charges 400.00

(iv) Other contingent expenses (per month)

Rent	700.00
Postage and Stationery	300.00
Telephone	200.00
Consumable stores such as diamond tools, other tools, etc. (Imported)	2000.00
Repairs and maintenance Rubber belt, rubber solution and glass plates, etc.	200.00
Transport charges	200.00
Advertisement and Publicity	100.00
Insurance	50.00
Taxes	150.00
Sales expenses	250.00
Miscellaneous expenses	200.00
	4400.00

(v). Total recurring expenses (Per month) : 43,750.00

(vi) Total working capital (on 3 months basis) 1,31,250.00

3. Total Capital Investment:

(i) Fixed Capital	10,49,800.00
(ii) Working Capital	1,31,250.00
	11,81,050.00

4. Cost of Production (per year)

Total recurring cost per year	5,25,000.00
Depreciation on Machinery Equipment @ 10%	1,09,000.00
Interest on total investment @ 15%	1,77,300.00
	8,07,300.00

5. Turnover (Per Year)

Item	Qty.	Rate	Value Rs.
Satin finish, sun ray finish, Radium filled dials	3.5 lakhs	@ Rs. 3/-	10,50,000.00

6. Net profit per year (Before income tax)	10,50,000.00 8,07,300.00
	2,42,700.00

7. Net profit ratio % $\frac{242,700 \times 100}{10,50,000} = 23\%$

8. Rate of return % $\frac{2,42,700 \times 100}{11,81,050} = 20.5\%$

9. Break-even point (% of total production envisaged)

(i) Fixed Cost :

(a) Depreciation (on machinery equipment)	1,05,000.00
(b) Rent	8,400.00
(c) Interest on total investment	1,77,300.00
(d) Insurance	600.00
(e) 40% salary & wages	53,280.00
(f) 40% other contingent expenses excluding rent & insurance)	17,520.00

Total 3,62,100.00

(ii) Net profit per year : 2,42,700.00

B.E.P. % $\frac{3,62,100 \times 100}{3,62,100 + 2,42,700}$
 $\frac{3,62,100}{6,04,800}$
 Say : 60%

10. Additional information (if any)

This is a specialised line of industry which requires highly skilled technicians in the metal finishing techniques. Some of the chemicals and equipments have to be imported for producing high quality dials. The industry requires special training in Dial making for watches.

11. Addressees of machinery Suppliers

1. M/s. I.A. E.C. & Co. (P) Ltd., Forbes Street, Bombay-1	—Sl No. 1, 2 and 17
2. M/s. Godrej & Boyce, Bombay.	—Sl. No. 2
3. M/s. Prem Engg. Works Okhla, New Delhi-20	—Do—
4. M/s. Scientific Instrument Co. Bombay.	—Sl. No. 14 and 18
5. M/s. Khandelval Udyog Ltd., Bombay	—Sl. No. 10
6. M/s. Solanki Machinery Works, Rajkot	—Sl. No. 4
7. M/s. Posolux S.A., 2500, Bienne, Switzerland	—Sl. No. 4 and 5

8. M/s. Charles Reutchi, Switzerland —Sl. No. 5
9. M/s. Perfect Machine Tools, Bell Build-
ing, Sir PM Road, Bombay-1.
10. M/s. Camera Works, India House,
Bombay.
11. M/s. Asia Pvt. Ltd., Bombay
12. M/s. W. Marrier KG Germany —Sl. No. 11
13. M/s. Metalising Equipment Bombay
14. M/s. Fibre Glass Corporation — Sl. No. 16
Richmond Road, Bangalore.
15. M/s. Greni Niel & Co., Bombay
16. M/s. Vaccum Pumo (P) Ltd., Madras
17. M/s. Jolts Engg. Co. Bombay

18. M/s. Vibronics Bombay-21.
19. M/s. Ronak Engineering Co., Bombay
20. M/s. Consolidated Premalis, Bombay.
21. M/s. Hind Hi-Vacuum Co., Bangalore
22. M/s. SLM Mankelal & Co., Bombay

Raw Material Suppliers :

1. M/s. Indian Smelting Co., Bombay.
2. M/s. Charles Reutchi, Switzerland.
3. M/s. Hacfali & Company, Switzerland.
4. M/s. W. Maier K G West Germany
5. M/s. JB Advani & Co., Bombay.

(Reserved item Sl. No. 783)

I. Introduction—Product & Its uses.

Water meter is an important instrument which is used for measuring the flow of water. There are two classifications:—

- (i) Inferential Types.
- (ii) Semi-positive type.

Water meters are specified in the range and size of the meter such as 15mm., 25 mm., 40 mm, an 50 mm.

I-B Market potential:

The demand of water meter is influenced primarily by provision of more and more filtered water supply coupled with increase in house building activities. Other factors influencing an demand of water meters are increase in the degree of urbanisation, growth of industrial townships following industrial development and lastly supplanting of flat rate by one varying with the degree of consumption of water.

II. Production Target: 6,000 meters p. a. for Rs. 10,80,000.

III. PRODUCTION DETAIL AND PROCESS OF MANUFACTURE.

The proposed scheme envisages the manufacture of water meter (domestic type). the production capacity of the unit will be 500 meters per month. It is presumed that the following components and parts will be purchased from outside for the manufacture of water maters:

1. O-ring (Rubber Washer).
2. Pins, Nuts, Washers.
3. Impeller Shaft with Jewel.
4. C.I. Bodies.
5. Dial Cover (Glass).
6. Springs.
7. Wipers, Aluminium Washer etc.
8. Brass knobe.

The manufacture of water meters resolves into the following sub-assemblies:—

- (a) Manufacturing and fitting of outer body and Cover.
- (b) Registration assembly or fitting of the rotary block work or counter mechanism.

- (c) Manufacture of the impeller or rotary piston and chamber assembly.
- (d) Assembly of and connection and fitting
- (e) Inspection and testing.
- (f) Manufacture of dial and hands etc.

The process involves the following operations:—

Turning, drilling, tapping, threading, punching, moulding, gear hobbing etc.

IV. Quality, Standards and Specifications:

The details/specifications for water meter (domestic type) have been laid down in the Indan Standards Specification No. IS: 779-1968. This standard deals with the scope, technology, materials and manufacture, overall dimensions, performance, requirements, productuion devices, test to be carried out etc.

	Rs.
V. Land and Building (Rented) covered area 250 sq. mt.	500·00 p. m.
VI. Machinery and Equipment :	
1. Precision Centre lathe 340mm. Swing bed 600mm. with 3 HP motor. 1 No.	25,000·00
2. Capstan Lathe 25mm bar capacity swing overhead 200mm with 2 HP Motor 1 No.	60,000·00
3. High speed production lathe, max. bar cap. 32mm Swing over slide 160 mm with 1·5 HP motor and chucking (PMT Jude type or UMS type) 1 No.	25,000·00
4. Universal milling m/c. with 1000×260 mm bed with dividing heads, fixtures for milling components etc. type PMT model RPUI with 4 HP motor. 1 No.	30,000·0
5. Hand operated injection moulding m/c. 10 oz. capacity. 1 No.	1,000·00
6. High precision, High speed bench drilling m/c. 12mm cap. with tapping attachment and 1 HP motor 1 No.	8,000·00
7. Double ended bench grinder 8" wheel dia. 1 No.	1,500·00
8. Power press 20 tonnes cap. open back inclinable CI Frame, heavy extra duty with fly wheel with 2 HP motor. 1 No.	12,800·00
9. Screw Press 1 No.	1,000·00
10. Hand Fly Press No. 5 1 No.	2,000·00
11. Precisoion Gear Hobbing M/c. with phase hobbing attachment and accessories hobbing dia. 63 mm. max. hobbing length 40 mm max. pitch·075 per 100 with plunge cutting facilities and coolant pump etc. 1 No.	60,000·00

		Rs.
12. Horizontal polishing M/c.	1 No.	1,500.00
13. Tool grinding M/c.	1 No.	6,000.00
14. Spray painting M/c. with air compressor 60 CU-ft.		5,000.00
Installation charges.		20,000.00
		2,58,000.00
15. Test bench complete with testing of meter, master meters and reservoirs and pump etc.		3,500.00
16. Work benches, tables, racks etc.		2,000.00
17. Dies, tools, jugs, fixtures etc.		10,000.00
18. Office equipment and workshop furnitures		5,000.00
		2,79,300.00

VII. Raw Material and Bought out Components (per Month)

1. Acrylic sheets, bakelite, plastic, granules and powder 25kg. @Rs. 25/- per kg.	625.00
2. Stainless steel rods 25 kg. @100/kg.	2,500.00
3. Bronze casting 2000 kg. @20/- kg.	40,000.00
4. Brass 10 kg. @ Rs. 20/-kg.	200.00
5. Casting brass for nipples 300 kg. @15/kg.	4,500.00
6. Aluminium sheets 150 kg. @15/kg.	2,250.00
	50,075.00

(ii) Components and parts to be purchased for 500 meters (per month)

1. O Ring, rubber washer	50.00
2. Pins, Nuts, washer	50.00
3. Impeller shaft and Jewel	2500.00
4. CI bodies.	2500.00
5. Dial cover (glass)	500.00
6. Spring	125.00
7. Wipers, Aluminium Washer etc.	100.00
8. Brass knobs.	100.00
9. Other miscellaneous items.	200.00
	6,125.00

(iii) Indirect materials :

1. Lubricants, cutting oils, acids, waste cotton, paints.	225.00
2. Cutting tools etc.	2000.00
	2225.00

Total (i) + (ii) + (iii)

58,425.00

VIII. Staff and Labour Per Month

A. Administrative & Supervisory :

1. Manager	1 No.	500.00
2. Engineer	1 No.	500.00
3. Supervisor	2 Nos.	600.00
4. Inspector	1 No.	300.00
5. Ministerial staff	3 Nos.	600.00
6. Peon	2 Nos.	300.00
7. Chowkidar	1 No.	150.00
		2,950.00
8. Staff Welfare @ 30%		885.00
		3,835.00

B. Technical & Others :		Rs.
1. Machine operator	8 Nos.	2000.00
2. Setting operator	1 No.	300.00
3. Semi-skilled operators	4 Nos.	600.00
4. Fitter	4 Nos.	800.00
5. Helpers	2 Nos.	300.00
6. Packer	1 No.	125.00
		4,125.00
7. Staff welfare @ 30%		1,237.00

Total A+B=9,197/- Say Rs.

5,362.00
9,200.00

IX. Other Expenses

1. Power & Water	800.00
2. Maintenance and repairs	500.00
3. Printing, postage and stationery	100.00
4. Consumable stores.	200.00
5. Advertisement and publicity	200.00
6. Packing expenses.	250.00
7. Transportation charges	200.00
8. Taxes.	250.00
9. Other miscellaneous	200.00
10. Rent	500.00
	3200.00

X. Working Capital Per Month

1. Raw material	58,425.00
2. Personnel	9,200.00
3. Other expenses.	3,200.00
	70,825.00

XI. Capital Investment

1. Machinrey & equipment	2,79,300.00
2. Working capital for 3 months.	2,12,475.00
	4,91,775.00

XII. Cost of Production/Month

1. Recurring expenses.	70,825.00
2. Insurance	500.00
3. Depreciation on M/c. @ 10%	2,285.00
4. Depreciation on furniture @ 20%	83.00
5. Interest on capital investment @ 15%	6,147.00
	79,840.00

XIII. Sales Proceeds

By selling of 500 meters of assorted sizes	
15 mm & 20 mm domestic model @150/-	
450 Nos.	67,500.00
40 mm modestic model @ 400/- each	25 Nos
	10,000.00
50 mm domestic model @ 500/- each	25 Nos.
	12,500.00
	90,000.00

XIV. Profitability Per Month

Profit = Sales — Cost of production	
90000 — 79840 = Rs. 10,160.00	
Percentage profit on sales	$\frac{10160 \times 10}{90000} = 11.28\%$
Percentage profit of return	$\frac{10160 \times 12 \times 100}{491725} = 24.79\%$

XV. Break Even Point

Fixed Cost	
Rent	500.00
Interest	6147.00
Insurance	500.00
Depreciation	2368.00
40% salaries	2134.00
40% other expenses	1280.00
	12919.00

Say Rs. 13,000

Fixed Cost

Fixed cost + Profit

$$\begin{array}{rcl} & 13000 & \\ = & \frac{13000}{13000 + 10180} & = \frac{13000}{23160} = 56.13\% \end{array}$$

XVI. List of Machinery Suppliers

1. M/s. Industrial & Agricultural Engg. Co. (Bombay) Ltd
43 Dr. VB Gandhi, Marg, Fort, Bombay-400023.

2. M/s. Singhal Engg. Works,
Bapu Marg, Aligarh-202001.
3. M/s. National Engg. Works,
41, Khanna Market, Tis Hazari, Delhi-110006.
4. M/s. Batliboi & Co.,
26/59, Burhana Road, Kanpur (UP)
5. M/s. M.S. Machine Tools
Gopal Bagh, Coimbatore-641018.
6. M/s. Praga Tools Ltd.,
6-6/8/32, Karadiguda Road, Secunderabad-3.
7. M/s. Atlas Works Pvt. Ltd.,
119 Ripon Street, Calcutta-16.

XVII. Sources of Raw Materials :

1. M/s. A.T. Gooyee Metal Works Pvt. Ltd.,
1-Mall Road, Dum Dum, Calcutta-28.
2. M/s. Bombay Metal & Alloys Mfg. Co. Ltd.,
Deay Road, Bombay.

(Reserved item Sl. No. 788)

WEIGHING MACHINES/WEIGH BRIDGES
ORDINARY

I. Product and its uses

Weigh Bridge is a weighing device in which weight of a vehicle either empty or full can be read instantaneously. This device is used at places where quick weighing of cart load, truck load or wagon load of material is to be done. This is particularly required for heavy industries like Iron & Steel Coal Mines, Sugar factories, Jute Mills, Paper Mills etc. where weighing by manual method by using weighing balance is uneconomic and often not possible.

II. Market potential

Weigh Bridges has got good demand from heavy industries like iron and steel, coal mines and other mines, sugar factories, jute mills and Paper Mills and similar industries where either raw material or finished products are to be weighed quickly in bulk. This is also in great demand from Transport agencies, Railways and Ship-yards. With the growth of industrial activities in the country demand for weigh bridges is also growing.

III. Production Target

In the project profile a production target of 1 each of three popular capacities of weigh bridges viz., 5 M.T., 10 M.T. and 30 M.T. has been taken per month on the basis of single shift and on overage 25 working days per month.

IV. Product details and process of Manufacture

There are various types of weigh bridges. In this project profile only steel yard type weigh bridges has been taken up for manufacture. There is a platform on which vehicle to be weighed is placed. This weight is transmitted through a series of mechanism to the indicator of the graduated dial to read the particular weight. As a normal practice in the industry this project envisages to procure castings, knife edge bearings etc/ from reputed manufacturers. Machining, assembly finishing and testing work will be done in the unit concerned.

V. Inspection and quality control

Since a good number of components are to be assembled together it is advisable to check up dimensional correctness of individual com-

ponents to specified limit and tolerances so that ultimate performance of the machanism gives correct reading of the weight. Since little deviation may give wrong reading of weight resulting in direct loss to parties concerned extreme care should be taken to have checking for quality control at every stage of operation.

VI. Land and Building

Office, workshop and store covered area 250 Sq. meters rented @ Rs. 1,000 per month.

VII. Machinery and Equipment

		Rs.
1. Lathe 8' bed motorised	1 No.	20,000.00
2. Shaping Machine 18" stroke	1 No.	10,000.00
3. Shaping Machine 24" stroke	1 No.	14,000.00
4. Piller Drilling Machine 1½" capacity.	1 No.	3,000.00
5. Welding transformer 300 amp. capacity	1 No.	4,000.00
6. Gas cutting torch including deposit for cylinders		3,000.00
7. Motors 3 H. P. 3 Nos. 1½ H.P. 1 No. with starters and electricals for the 4 machines at Sl. Nos. 1 to 4 above.	4 Nos.	6,000.00
8. Chain pulley Block 5 capacity	o.	1,500.00
9. Hand tools and measuring instruments, patterns etc.	L.S.	5,500.00
10. Installation and Electrification		6,000.00
11. Furniture, Fixture including office equipment and type-writer		
12. Preoperative expenses like registration fees with weights & Measures Deptt., Factory licence etc.		5,500.00
		1,500.00
		80,000.00

VIII. Raw Material (Per Month)

(1) For 5 MT steelyard weight bridge 14' x 8'	
C.I. Lever—200 Kg x 3 No. = 600 @ Rs. 2.50	1,500.00
C.I. Transfer lever 200 kg. x 1 no. = 200 kg. @ Rs. 2.50	500.00
C.I. Frame 14' long 300 kg x 2 nos = 600kg @ Rs. 2.50	1,500.00
C.I. Frame 8' long 175kg x 2 nos. = 350kg. @ Rs. 2.50	875.00
M.S. flat form 8mm = 700kg. @ Rs. 2.50	1,750.00

	Rs.
Tee 8' x 3 nos = 200 kg. @Rs. 2.20	440.00
Knife & bearing 10 nos. each @Rs. 10.00	200.00
M.S. shackle 4 nos. @Rs. 5.00	20.00
M.S. Flat 1' x 3' @ Rs. 10.00	10.00
Brass plate with graduation @Rs. 50.00	50.00
C.I. stand for steelyard 25 kg. @Rs. 2.50	63.00
	6,908.00
(2) For 20 MT steelyard Weighbridge 20' x 8'	
C.I. lever 250 kg x 3 nos. = 750 kg. @ 2.50	1,875.00
C.I. Transfer lever 200 kg x 1 nos. = 200kg @Rs. 2.50	500.00
C.I. frame 20' long 500 kg x 2 nos. = 1000 kg @Rs. 2.50	2,500.00
C.I. frame 8' long 200 x 2 nos. = 400 kg. @Rs. 2.50	1,000.00
M.S. plate for platform 12mm = 1250kg @Rs. 2.50	3,250.00
M.S. Joist 300 x 140mm = 100kg. @Rs. 2.50	2,500.00
M.S. flat 3' x 1'	10.00
Knife—Bearing 10 nos. each @Rs. 10.00	200.00
Brass plate with graduation	50.00
M. S. shackle 4 nos @Rs. 5.00	20.00
C.I. stand for steelyard 30kg @Rs. 2.50	75.00
	11,980.00
(3) For 30 MT steelyard weighbridge 30' x 10'	
C.I. lever 250 kg x 5 nos = 1250kg. @Rs. 2.50	3,125.00
C.I. transfer lever 350 Kg x 1 No. = 350kg @Rs. 2.50	875.00
C.I. frame 30' long 750 kg 2 nos = 1500 kg @Rs. 2.50	3,750.00
C.I. frame 10' long 25 kg x 2 nos = 500 kg @Rs. 2.50	1,250.00
M.S. plate 12mm = 1750 kg @Rs. 2.50	4,375.00
M.S. Joist 300 x 140mm = 1500kg @Rs. 2.50	3,750.00
C.I. stand for steel yard = 30kg @Rs. 2.50	75.00
M.S. shackle 4 nos. @Rs. 7.50	30.00
Knife & Bearing 15 nos. each @Rs. 10.00	300.00
Brass plate with graduation	50.00
Total:	17,430.00
Total of three above	26,318.00
Cost of Welding Electrodes, gas including rental for cylinders	1,182.00
Total :	37,500.00
IX. Staff and Labour (Per Month)	
	Rs.
1. Manager 1 No.	1,000.00
2. Foreman/Supervisor 1 No.	800.00
3. Storekeeper/Accountant 1 No.	400.00
4. Clerk-cum-typist 1 No.	300.00
5. Skilled operators 4 Nos.	1,600.00
6. Semi-skilled workers 6 Nos.	1,500.00
7. Un-skilled workers 2 Nos.	400.00
8. Darwan-cum-Peon 1 No.	200.00
	6,200.00
Cost of labour benefits @10%	620.00
	6,820.00

	Rs.
X. Other Expenses (Per Month)	
1. Rent	1,000.00
2. Electricity	400.00
3. Consumable tools	250.00
4. Oil, Lubricant and other consumables	200.00
5. Maintenance	150.00
6. Cartage & Freight	500.00
7. Packing cost	500.00
8. Publicity	500.00
9. Sales expenses including travelling	500.00
10. Stationery, postage, insurance, legal charges, fees licences and other miscellaneous expenses.	500.00
	4,000.00
XI. Working Capital (Per Month)	
1. Raw material	37,500.00
2. Staff and labour	6,820.00
3. Other expenses	4,000.00
	48,320.00
XII. Total Capital Investment	
1. Machinery & Equipment	80,000.00
2. Working capital for 3 months	1,44,960.00
	2,24,960.00
XIII. Cost of Production (Per Annum)	
1. Raw material	4,50,000.00
2. Staff & labour	81,840.00
3. Other expenses	48,000.00
4. Interest on capital @15%	22,496.00
5. Depreciation on machinery @10%	8,000.00
	6,10,336.00
XIV. Total Sale (Per Annum)	
1. Weight Bridge 5 M.T. capacity 12 nos. @Rs. 12,000/- each	1,44,000.00
2. Weigh Bridge 10 M.T. capacity 12 nos. @Rs. 20,000/-	2,40,000.00
3. Weight Bridge 30 M.T. capacity 12 nos. @Rs. 30,000/- each	3,60,000.00
	7,44,000.00
Less sales commission @10%	74,400.00
	6,69,600.00
XV. Profitability (Per Annum)	
Total sale—cost of production = Profit	
Profit = Rs. (6,69,600—6,10,330) = Rs. 59,264.00	
(a) Percentage of profit on sale = $59,264 \times 100$	
	6,69,600 = 9% approx.

(b) Percentage of return on capital

$$\frac{59,264 \times 100}{2,24,960} = 26\% \text{ approximately.}$$

XVI. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed cost} \times 100}{(\text{Annual Fixed Cost} + \text{Profit})}$$

Annual Fixed Cost

	Rs.
1. Rent	12,000.00
2. Interest	22,496.00
3. Depreciation on machinery & equipment	8,000.00
4. 40% of salary	32,736.00
5. 40% of other expenses (Excluding rent)	14,400.00
	89,632.00

$$\text{B.E.P.} = \frac{89,632 \times 100}{(89,632 + 59,264)} = 60\% \text{ approx.}$$

XVII. Name and Addresses of Machinery Suppliers

1. M/s. Batliboi & Co.,
Sir P.M. Road,
Fort, Bombay-1.
2. M/s. Acme Machine Tools Mfg. Co.,
167/1, Belilious Road,
Howrah-1
3. M/s. Vivekananda Engg. Works,
12C Despran Sasmal Road,
Howrah.

(Reserved item Sl. No. 529)

M & M Industries 113 WHEAT THRESHERS AND MAIZE SHELLERS

I. Product details and its uses

Agricultural machinery play an important role in increasing the agricultural production in the country. The most common agricultural machines are; wheat threshers, maize shellers, trailer, pump sets, etc. This project envisages the manufacturing of wheat threshers, Maize shellers and repair of all types of agricultural machinery.

Wheat Threshers and Maize Shellers are used to separate the grains from respective crops. The machinery incorporated in the scheme a very much suitable for manufacturing & repair of agriculture machinery. Since the manufacturing of these machines is seasonal, it is suggested to undertake the repair work during off season to give adequate work load to the unit through out the year.

II. Production targets

India is mechanising her agricultural Industry at national level. As such there is good marketing scope of agricultural machines in all the States.

The unit will manufacture 200 wheat threshers and 200 Maize Sheller in 8 months and will undertake repair work of agricultural machines in the remaining period of the year.

III. Production details and process of Manufacture

The manufacturing process of wheat threshers and Maize Shellers is essentially a fabrication job. The raw materials involved are angle iron, M.S. rounds and squares, M.S. flat and B.P. Sheet etc. The materials are cut into required shape and size and then welded together to make the frame. The shafts are turned on the lathe. Bolts, nuts, screws etc. are purchased from the market. After assembly the machines are painted.

IV. Inspection and Quality Control

The following ISI specifications are available and should be used to manufacture quality products.

1. IS: 6320-1971 Wheat Power Thresher (Hammer Mill Type)

2. IS: 7051-1973 Power Maize Sheller.

The sheet material parts are normally cut with the help of templates. For quick and easy assembly precision measuring workshop tools and gauges should be used. Each piece should be tested for proper and smooth running before painting and patch.

V. Land and Building		Rs.
1. Land 1000 Sq. Metres @25/-per Sq. metre		Rs. 25,000.00
2. Building 300 Sq. metres covered area		60,000.00
@Rs. 200 per Sq. metre.		85,000.00

VI. Plant and Machinery		Rs.
1. Lathe machine 8' bed complete with 3 H. P. Electric Motor, 3 Ph 440 Volt and Starter	1	12,000.00
2. Lathe Machine 6' bed complete with 3 ph. 400/440 V 3 H. P. Electric Motor and starter	1	10,000.00
3. Pillar drilling machine 1½" capacity with 1 H.P. Electric Motor and starter		2,800.00
4. Pillar drilling Machine 1" cap. with 1 H. P. Electric Motor and Starter	1	2,500.00
5. Portable drilling machine ½" cap.		1,200.00
6. Electric welding set 300 Amp. 3 phase 440/440 Volts	1	1,500.00
7. Double ended bench grinder 8" wheel size	1	1,500.00
8. Power Hacksaw Machine 150 mm bar capacity complete with Electric Motor and starter	1	2,500.00
9. Hand shearing Machine 1/8" thick sheet cap.	1	1,200.00
10. Hand Tools, Measuring instrument etc.		2,500.00
11. Erection and Installation		3,800.00
12. Office Furniture and equipments		1,500.00
		43,000.00

VII. Raw Materials Required (Per Month)

Description	Quantity	Value (Rs.)
1	2	3
1. Angle Iron 25 × 25 × 3 to 65 × 65 × 8	8.0 M. Ton	20,000.00
2. M. S. Rounds 12 to 65 mm	1.5 M. Ton	4,500.00
3. M. S. Square upto 38 mm	1.5 M. Ton	4,500.00
4. B. P. Sheet. 10 to 18 G	8.00 "	32,000.00
5. M. S. Flat 25 × 3 to 50 × 6 mm	1.00 "	30,000.00
		64,000.00

VIII. Staff & Labour (Per Month)

		Rs.
1. Accountant-cum-clerk	1	400.00
2. Chowkidar	1	200.00
3. Turner	2	500.00
4. Drillman	2	400.00
5. Welder	1	300.00
6. Foreman	1	500.00
7. Helper	1	200.00
		<u>2,500.00</u>

IX. Other Expenses (Per Month)

	Rs.
1. Electric charges	250.00
2. Bought out components i.e. Nut, Bolts, welding electricals etc.	500.00
3. Oil & Lubricants and cutting tools	200.00
4. Postage & Stationery	50.00
5. Transportation/travelling expenses	200.00
6. Cartage etc.	300.00
	<u>1,500.00</u>

X. Working Capital (Per month)

	Rs.
1. Raw Materials	64,000.00
2. Staff and labour	2,500.00
3. Other Expenses	1,500.00
	<u>68,000.00</u>

XI. Total Capital Investment

	Rs.
1. Plant & Machinery	43,000.00
2. Land & Building	85,000.00
3. Working capital for three months @ Rs. 68,000/- per month	2,04,000.00
	<u>3,32,000.00</u>

XII. Cost of Production (Per Month)

	Rs.
1. Recurring Expenses $68,000 \times 12 =$	8,16,000.00
2. Interest on Capital investment @ 15%	49,800.00
3. Depreciation on machins and equipment @ 10%	4,000.00
4. Depreciation on Building @ 5%	4,250.00
	<u>8,74,050.00</u>
Say, Rs.	<u>8,74,000.00</u>

XIII. Sales Proceed (Per annum)

	Rs.
1. By sale of 200 Nos. Wheat threshers @ Rs. 2,800/- each	5,60,000.00
2. By sale of 200 Nos. Maize Sheller @ Rs. 2,000/- each	4,00,000.00
3. By job work for four months @ Rs. 2,500/- per month	10,000.00
	<u>9,70,000.00</u>

XIV. Profitability

	Rs.
Sale per annum	9,70,000.00
Cost of production	8,74,000.00
	<u>96,000.00</u>

(a) Percentage of Profit on sales

$$= \frac{96,000 \times 100}{9,70,000} = 10\%$$

(b) Percentage of return on investment

$$= \frac{96,000 \times 100}{3,32,000} = 28.9\%$$

XV. Break Even Analysis

$$B. E. P. = \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Fixed Post} + \text{Profit}}$$

Annual Fixed Cost :

	Rs.
1. Interest on Capital	49,800.00
2. Depreciation	8,250.00
3. 40% of Salaries	12,000.00
4. 40% of other Expenses	7,200.00
	<u>77,250.00</u>

$$B. E. P. = \frac{77,250 \times 100}{\frac{77,250 + 96,000}{77,250 \times 100}} = \frac{77,250 \times 100}{1,73,250} = 44.5\%$$

XVI. Suppliers of Machinery and Equipment

1. M/s. Batliboi & Co.,
98-A, Armanian Street,
MADRAS-1.
2. M/s. Perfect Machine Tools,
1, Smith Road, MADRAS.
3. M/s. Millhard & Co. (P) Ltd.,
G. T. Road, Miller Ganj,
LUDHIANA-14003
4. M/s. New United Engineering Works,
G. T. Road, Miller Ganj,
LUDHIANA.
5. M/s. Alpha Machinery Manufacturing,
G. T. Road,
BATALA.

NOTE :—Raw Materials are available in the market.
(Reserved item Sl. No. 508)

I. Product & Its Uses

Wheat and paddy threshers are agricultural implements used for mechanical threshing of wheat and paddy to separate them from the straw. This quickens post harvest agricultural operation to facilitate cultivators to send their produce to the market early.

II. Market Potential

With a nation-wide drive for growing more food it has become imperative to cut down time for cultivation at its every operational stage. Moreover owing to pressing need of our growing population multiple cropping has become a must. Government is making all out effort to bring more and more areas of land under multiple cropping programme by providing better irrigational facilities, liberal supply of fertilisers etc. Hence it is considered necessary to cut down time for post harvesting work like threshing etc. to enable our men with plough to go again to the field for the next crop. So use of wheat and paddy threshers is becoming more and more popular and manual threshing is being progressively discarded all over the country. Considering the vastness of the country and its similarly vast agricultural operations to feed 600 million of our population requirement of agricultural implement like wheat and paddy thresher is quite considerable. As such there is a good market for this item.

III. Production Target

The project has got a target for manufacturing 50 Nos. of threshers per month based on single shift operation and on average 25 working days per month.

IV. Production Details and Process of Manufacture

Thresher is a rotating drum with good number of bent galvanised wire fixed on its surface to hit the grains of paddy or wheat for their separation from the stem. They are available in several sizes 2'-6' long $\times$ 15' dia drum size being quite popular one has been taken in this project profile for the purpose of calculation. Salwood battens are fixed on the surface of a rigidly constructed steel cylindrical frame. GI wire hair pin like bent pins are fixed on this wooden sur-

face in some particular arrangements for convenience of threshing operation. A shaft with ball bearing is, fitted with it for rotating purpose. The project profile is for manufacturing pedal driven threshers since in rural area power may not be available everywhere with the cultivators. However, it is desirable to run them with power, it can be easily done with suitable coupling arrangement after dismantling the pedal.

V. Inspection and Quality Control

While fabricating the drum care should be taken so that it is not unbalanced. This will result in heating of bearings and damage of the same early. This can be controlled if care and checking is done on correctness of size of each individual member before welding the same. Since good number of members are of same size suitable templates may be made to control the accuracy of these lengths. Similarly for the diameter of the shaftings go and no go gauges may be used. Since ultimate use of the machine is quite crude no much use of precision gauges etc. is necessary. Only normal control of dimensional accuracy according to the design of the equipment is sufficient.

VI. Land and Building

Office workshop and stores cover area 250 sq. Meters rented @ Rs. 750/ per month.

VII. Machinery and Equipment

1. Centre Lathe 5'-0" bed with 2 HP Motor, electricals and standard accessories	2 Nos.	Rs. 21,000.00
2. Pillar Drilling Machine 1" capacity with 1 HP Motor electricals and standard accessories	1 No.	3,500.00
3. Power Hack Saw Machine 6" $\times$ 6" size with 1 HP Motor & electricals	1 No.	2,500.00
4. Hand Lever Shearing Machine 10" long heavy duty	1 No.	1,000.00
5. Electric Arc Welding Set 350 Amp. (Transformer type) with cable & accessories	1 No.	5,000.00
6. Air Compressor 85 p.s.i. with spray painting equipment capacity 5 cft/min.	1 No.	4,500.00
7. Portable drilling machine 3/8" capacity	1 No.	1,500.00
8. Portable hand grinder	1 No.	1,500.00
9. Initial stock of tools, jigs fixtures and gauges	L.S.	4,000.00

10. Hand tools and measuring instruments		2,000.00
11. Installation and electrification	L. S.	4000.00
12. Furniture, fixture including office equipment and Type-writer	L. S.	4,500.00
		<u>55,000.00</u>

VIII. Raw Material (Per Month)

1. M.S. Angle 25×25×3mm	—	600 kg.
35×35×5mm	—	125 kg.
2. M.S. Flat 35×6mm	—	100 kg.
3. M.S. Bar 22 mm dia, 6mm dia	—	150 kg.
		<u>975 kg.</u>

Say 1 M. T

Rs.

@ Rs. 2,500/per Mt. 2,500.00

4. M.S. Sheet 3 mm	—	400 kg
20 SWG	—	700kg.
		<u>1100 kg.</u>

Rs.

@ Rs. 4,00/- per Mt. 4400.00

5. M.S. Tube 20 mm bore 125' long		350.00
6. Cast Iron Casting components (for hub, bracket, hanger, penion etc.) 1. M.T. @Rs. 2,400/- per M.T.		2400.00
7. Ball bearing 20 mm bore 100 Nos.		1,750.00
8. G.I. Wire 10 SWG 375 kg. @ Rs. 3.50 per kg.		1,312.50
9. Salwood 20 cft. @Rs. 30/- per cft.		600.00
10. Welding Electrode		1,000.00
11. Paint lead oxide & grenn 50 litres		1,000.00
12. Machine-Screw, Nut, bolts etc. L.S.		1,250.00
		<u>16,562.50</u>
Say		<u>16,600.00</u>

IX. Staff and Labour (Per month)

		Rs.
1. Manager	1 No.	800.00
2. Foreman/Supervisor	1 No.	600.00
3. Store keeper/Accountant	1 No.	300.00
4. Skilled Operator	2 No.	1,200.00
5. Semi-skilled workers	5 No.	1,250.00
6. Unskilled Workers	6 No.	1,200.00
7. Watchman-cum-peon	1 No.	200.00
8. Sales man	1 No.	450.00
		<u>6,000.00</u>
Cost of Labour benefits @ 10%		600.00
		<u>6,600.00</u>

X. Other Expenses :

	Rs.
1. Rent	750.00
2. Electricity	800.00
3. Consumable Tools	300.00
4. Oils, Lubricants and other consumable stores	200.00
5. Maintenance	150.00
6. Cartage & Freight	250.00
7. Packing Cost	600.00
8. Publicity	500.00
9. Sales Expenses Including travelling	500.00
10. Stationary, Postage, Insurance Legal charges, fees, Licences and other Misc. expenses	250.00
	<u>4,300.00</u>

XI. Working Capital Required (per month)

	Rs.
1. Raw Material	16,600.00
2. Staff & Labour	6,600.00
3. Other Expenses	4,300.00
	<u>27,500.00</u>

XII. Total Capital Investment

	Rs.
1. Machinery & Equipment	55,000.00
2. Working Capital for 3 months	82,500.00
	<u>1,37,500.00</u>

XIII. Cost of Production (per Annum)

	Rs.
1. Raw Material	1,99,200.00
2. Saff & Labour	79,200.00
3. Other Expenses	51,600.00
4. Interest on capital @15%	20,625.00
5. Depreciation on M/c @10%	5,500.00
	<u>3,56,125.00</u>

XIV. Total Sale (Per Annum)

	Rs.
By sale of 600 Nos Paddy Threshers and Wheat Threshers @ Rs. 650/—each-	Rs. 3,90,000.00

XV. Profitability (per Annum)

Total Sale—Cost of Production=Profit	
Profit-Rs. 3,90,000—Rs. 3,56,125=	33,875.00
(a) Percentage of profit on sale	$\frac{33,875 \times 100}{3,90,000} = 9\% \text{ appx.}$
(b) Percentage of return on capital	$\frac{33,875 \times 100}{1,37,500} = 25\% \text{ approx.}$

XVI. Break Even Analysis

	Annual Fixed Costx100
B.E.P.	$\frac{\text{Annual Fixed Cost}}{\text{Annual Profit}}$

Annual Fixed Cost

	Rs.
1. Rent	9,000.00
2. Interest	20,625.00
3. Depreciation on Machinery & Equipment	5,500.00
4. 40% of salary	31,680.00
5. 40% of other expenses	17,040.00
	<u>Rs. 83,845.00</u>

$$\text{B.E.P.} = \frac{83,845 \times 100}{83,845 + 33,875} = 71\% \text{ approximately.}$$

XVII. Names and Addresses of Machine Suppliers

1. M/s. Power Tools & Appliances Co.,
2, BBD Bagh (East)
Calcutta-1.
2. M/s. Acme Machine Tools Mfg. Co.,
167/1, Belilious Road, Howrah-1.
3. M/s. Kala Machine Tools,
No. 119, Shivaji Road,
4. M/s. Weldmaster Electrical Co. (India)
Weldmaster House, Church Road, Kashmere Gate,
Delhi-6.
5. M/s. Machine Tool Trader Impex,
75, Ganesh Chandra Avenue,
Calcutta-13.
6. M/s. Turner & Tools,
15, Ganesh Chandra Avenue
Calcutta-13

(Reserved Item 51 No. 501).

I. Product and its Uses

(a) The wheel chairs are mostly required in Hospitals for moving the patients from one place to another. These are propelled by an attendant or sometimes by the patient himself. The wheel chair is of two types. One is folding type and the other is non-folding. For both these types ISI standards are available.

(b) Market Potential:

The demand of such type of chairs is increasing day by day with the increase of more and more hospitals and nursing homes in the country. Keeping in view the past trend and factors governing the demand, the demand is expected to increase by about 5% per annum in the coming five years.

II. Production Target

The basis for the calculation of the production capacity is calculated on single shift basis on 75% efficiency. In this scheme it is proposed to produce 1200 chairs per annum. The bought out components for this scheme will be such as rims, spokes, aluminium foot rests, castors, seats back with natural cane or synthetic cane, rubber types hand grips and wooden arm rests etc.

III. Production details and process of Manufacture**(a) Process Outline**

1. Cutting of Pipe
2. Bending to shape
3. Welding.
4. Grinding
5. Painting
6. Assembly of wheel and other parts
7. Final Assembly.

IV. Quality Control and Standards

The details worked out below for the manufacture of wheel chairs has been based on the ISI No. 6571-1972.

V. Land and Building

Covered areas 200 sq. meter
@Rs. 10/- per sq. mtr.

2,000.00(P.M.)

VI. Machinery and Equipment**(a) Production Unit :**

Sl. No.	Description	Indigenous/ imported	Qty.	Price (Rs.)
1.	Pipe bending M/c. hydraulic type Cap 1/2" to 2" (Hand Operated)	Indigenous	1 No.	5,000.00
2.	Gas welding set with welding torch	Do.	2 Nos.	4,000.00
3.	Bench Drilling m/c. 1/2" cap. 1/2 H.P.	Do.	1 No.	2,500.00
4.	Portable drilling m/c. 1/2" cap 1/4 H.P.	Do.	1 No.	1,500.00
5.	Flexible shaftgrinder 1/4 H.P. Wheel dia 6"	Do.	1 No.	1,500.00
6.	Double ended bench grinder 2H. P. Wheel 10"	Do.	1 No.	1,000.00
7.	Hand Shearing m/c. 1/8" cap	Do.	1 No.	800.00
8.	Baking Oven 6'x5'x6' electrically operated 10 KV.	Do.	1 No.	10,000.00
9.	Hand Press No. 4	Indigenous	1 No.	800.00
10.	Hand Press No. 2	Do.	1 No.	400.00
11.	Cleaning tank 4'x4' x5'	Do.	3 Nos.	6,000.00
12.	Cleaning tank with rubber lining	Do.	1 No.	4,000.00
13.	M.S. Plate 3/4" thick size 4'x4' for levelling	Do.	1 No.	500.00
14.	Compressor with spray gun 1 H.P.	Do.	1 No.	3,000.00
				41,000.00

(b) Testing equipment

Measuring instruments such as measuring tapes, Foot rule, wire gauges etc.	Rs. 1,000.00
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**(c) Electrification & Installation
charges @ 10% of cost of
machines and equipment**

4,000.00

Total cost of machinery & equipment

46,000.00

(iii) cost of fixtures

2,000.00

(iv) Cost of office equipment/working
table etc.

5,000.00

(v) Pre-operative expenses

2,000.00

Total fixed capital

55,000.00

245

VII. Raw Materials including packaging Requirements(Per-Month)

Particulars	Indigenous/ imported	Qty.	Rate	Value (Rs.)
1. ERW M.S. Pipe Indigenous 25 mm.		4000 ft.	Rs. 1.50 range	6,000.00
2. ERW M.S. Pipe 12 mm dia	Do.	500 ft.	Rs. 1	500.00
3. Aluminium sheet 2 mm thick	Do.	150 Kg.	Rs. 20/-	3,000.00
4. Screws	Do.	—	—	200.00
5. Paint	Do.	20 Lit	Rs. 25/- per lit.	500.00
6. M.S. Wire 10 mm dia	Do.	100 Kg.	Rs. 3/-	300.00
7. M.S. Strip 2 mm thick	Do.	500 kg.	Rs. 2/50	1,250.00
8. Raxin, nails etc.	Do.	—	—	500.00
Total cost of Raw material				12,250.00

Bought out component

1. Wheel rim conforming to IS : 624-1961	Do.	200 Nos.	Rs. 20 each	4,000.00
2. Cycle spokes conforming to IS-630-1961	Do.	500 do	Rs. 3/- doz.	1,500.00
3. Tyres solid type conforming to IS-2415-1969	Do.	200	Rs. 10/- each	2,000.00
4. Canned Back & seat	Do	100 sets	Rs. 25/ Rs per set	2 500.00
5. Castors conforming to IS-4034-1969 No. HN-125	Do.	100 pairs	Rs. 35/- per pair	3,500.00
6. Foot rests Aluminium casted	Do.	100 pairs	Rs. 25/- per pair	2,500.00
7. Arm Pests (Wooden)	Do.	100 pairs	Rs. 3/- per pair	300.00
8. Ball bearings	Do.	400 Nos.	Rs. 8/- each	3,200.00
9. Miscellaneous Electroplating/ anodising	Do.			1,000.00 20,500.00
Total of (i) & (ii)				32,750.00

VIII. Staff and Labour (per month) :

(a) Personnel

Designation	No.	Salary (Rs.)	Total (Rs.)
(Administrative & Supervisory)			
1. Manager	1 No.	1000/-	1,000.00
2. Accountant-cum-Store-keeper	1 No.	500/-	500.00
3. Clerk-cum-typist	1 No.	300/-	300.00
4. Peon/Chowkidar	3 Nos.	300/-	600.00

(Technical-skilled and Unskilled)

5. Foremen	1 No	800/	800.00
6. Skilled workers	2 Nos.	400/-	800.00
7. Semi-skilled workers	2 Nos.	300/-	600.00
8. Helper	2 Nos.	200/-	400.00

Total (Salaries) 5,000.00

(+) Perquisites 15% of salaries 750.00

Total 5,750.00

IX. Other contingent expenses (per month) : Rs.

1. Power	250.00
2. Water	55.00
3. Rent	2,000.00
4. Telephone	250.00
5. Postage & Stationery	100.00
6. Consumable stores	250.00
7. Repairs & Maintenance	250.00
8. Transport Charges	500.00
9. Advertisement & Publicity	250.00
10. Insurance	100.00
11. Taxes	100.00
12. Sales Expenses 2%	1,600.00
5,705.00	

X. Working Capital (per month)

1. Raw material	32,750.00
2. Salary of Staff and Labour	5,750.00
3. Other expenses	5,705.00
44,200.00	

Working Capital for 3 months ×3

32,600.00

XI. Total Capital Investment

(i) Fixed Capital	55,000.00
(ii) Working capital for 3 months	1,32,600.00
1,87,600.00	

XII. Cost of production (per year) :

1. Total recurring cost per year	5,30,400.00
2. Depreciation on machinery & equipment @10%	4,600.00
3. Depreciation on Fixtures @25%	500.00
4. Depreciation on office equipment @20%	1,000.00
5. Interest on total investment @15%	@28,140.00

Total cost of production 5,64,640.00

XIII. Sales proceeds (per year) :

Item	Qty.	Rate	Value (Rs.)
Chairs	1200	Rs. 575/- per chair	6,90,000.00

XIV. Profitability (per year) :

Sale—Cost of Production Profit		
Rs. 690,000—Rs. 5,64,640	=	1,25,360.00
Percentage of profit over sales	$\frac{1,25,360 \times 100}{6,90,000}$	= 18.16%
Percentage of return on investment	$\frac{1,25,360 \times 100}{1,87,600}$	= 66.7%

XV. Break Even Analysis :

$$\text{B.E.P.} = \frac{\text{Fixed Cost} \times 100}{\text{Fixed Cost} + \text{Profit}}$$

Fixed Cost

1. Depreciation on Machinery	4,600.00
2. Depreciation on fixture	500.00
3. Depreciation on Equipment	1,000.00
4. Interest	28,140.00
5. Rent	24,000.00
6. 40% of Salaries	24,000.00
7. 40% of overheads	27,400.00
	1,09,640.00

$$\text{B.E.P.} = \frac{1,09,640 \times 100}{(1,09,640 + 1,25,360)} = 46\%$$

XVI. Name and Addresses of Machinery and Equipment suppliers :

1. M/s. Vankos Indl. Area, Patna	} Pipe Bending M/c
2. M/s. Roop Chand Uttam Chand Industries, 80, G.B. Road, Delhi.	
3. M/s. New Works (P) Ltd. F.28/29, Naini-Indl. Estate Naini, Allahabad.	

4. M/s. Malik Electric Works, 13, Victoria Road, Low Level, Bombay-10 DD.	} Elect. Welding Set & Gas Welding Set.
5. M/s. Indian Oxygen Najafgarh Road, New Delhi.	
6. M/s. Mahalakshmi Engg. Works 26, DLF Indl. Area, New Delhi	} Bench Drilling m/c
7. M/s. Kala Machine Tools 119, Shivaji Road, Shivaji Nagar, Bangalore	
8. M/s. Diamond Engg. Co.-51, B-2/52, Shri Mohalakshmi Co-operative Housing Society, Ltd., Veer Desai Road, Andheri Bombay.	} Revetting-Portable drilling m/c Flexible shaft grinder (wolf) Double ended Grinder.
9. M/s. Moti Ram & Sons. Sarda Nand Marg, Delhi-6	
10. M/s. Indian Expeller works (P) Ltd. No. A-4, Naroda Indl. Estate Naroda, Ahmedabad (Gujarat).	Hand Press
11. M/s. K.G. Khosla & Co. Mathura Road, Faridabad.	} Compressor with Gun.
12. M/s. Manjeet Engg. Works 71/1, Najafgarh Road, Delhi	
13. M/s. United Machine Tools (Corpn.) G.T. Road, Miller Ganj, Ludhiana-3.	} Lathe
14. M/s. Leading Engg. Works, New Rohtak Road, Anand Parbat, New Delhi-5.	
15. M/s. Precision Controls Plot No. 20, SIDCO Indl. Estate Ambattur, Madras.	Baking oven
16. M/s. Narang Scientific Works Indl. Area, Naraina, Phase II, New Delhi.	} Cleaning Tanks.
17. M/s. Bright Metal Industries A-K-14, Arakasha Road, Paharganj, New Delhi.	

XVII. Raw Material suppliers :

Can be procured from the local market.

(Reserved item Serial No. 401).

I. Products and Their Uses

Automobile Window Channels as the name indicates are required to be positioned in the car or bus bodies to facilitate movement of window glass upward or downward. The Channels of various sections extruded by large aluminium companies are suitable for manufacture. An anodising plant is required to be attached with a manufacturing unit as many of the State Road Transport Undertakings who are the main customers for these products ask for anodised finish.

II. Market Potential

Day by day, road transport buses are becoming popular for travel and almost all the State Transport Corporations are expanding their activities in different regions. For this every year they are increasing their number of buses for which they require substantial quantity of this item. Since, processing does not require very high skill, this item can very suitably be taken up by small scale ancillary units.

III. Production Target

In this project it is proposed to produce 300 nos. Window Channels of Public Buses per month.

IV. Production Details And Process of Manufacture

For the manufacture ready extruded sections from Indian Aluminium or Hindusthan Aluminium Corporation has to be purchased. For anodising the materials, highest degree of purity is desirable. The sections of different varieties according to the customer's design may be obtained from these parties, may be cut to the desired length and polished properly. Then those are to be anodised wherever necessary. Prior to anodising chemical treatment for removal of oil, grease or oxides are required.

V. Quality Control And Standards

There is no Indian Standard Specification on this particular item. Quality Standard has to be devised as per customer's requirements. For the guidance in purchase and manufacturing facilities, following I. S. I. Specifications may be referred:

IS:3921-1966 Aluminium Channels

IS:5523-1969 Method of testing Anodic Coatings on Aluminium.

Anodic Coatings are hard, abrasive and corrosion resistance oxide coatings. These finishes are bright and permanent: but for proper anodising, adequate care must be taken for degreasing and rinsing in running water thoroughly.

VI. Land and Building :

Covered area of 70 sq. metre to be rented @ Rs. 5/- per square metre per month. 350/- p.m.

VII. Machinery and Equipment :

	Rs.
1. Metal Cutting Circular Sawing M/c. with accessories and attachments	8,000.00
2. 24 Volts 350 amperes Rectifier	20,000.00
3. Anodising tank with lead lining	4,000.00
4. Degreasing tank	500.00
5. Etching tank	500.00
6. Sealing tank, Stainless steel or Aluminium with hot polymerised Synthetic Coating	2,000.00
7. Dyeing tanks, Stainless steel or Aluminium with hot polymerised Synthetic Coating—3 nos.	6,000.00
8. Rinsing tanks, sheet iron rubber lined—2 nos.	3,000.00
9. Buffing machines with accessories—2 nos.	3,000.00
10. Double ended pedestal Grinders—2 nos.	3,000.00
11. Fitter's bench, hand tools etc.	2,000.00
12. Furnitures, Fixtures, Office Equipment	3,000.00
13. Erection, electrification etc.	5,000.00
	60,000.00

VIII. Salaries And Wages (per month)

1. Engineer-cum-Manager	1,000.00
2. Clerk-cum-Accountant	600.00
3. Chargehand	500.00
4. Semi Skilled workers—4 nos.	1,000.00
5. Unskilled workers—4 nos.	800.00
6. Watchman/Peon—2 nos.	400.00
7. Labour amenities	500.00
	4,800.00

IX. Raw Materials (per month):

1. Aluminium Window Section of average weight 0.5 kg/metre, 720 metres @ Rs. 22 per kg.	7,920.00
2. Anodising materials (lump sum)	4,000.00
	11,920.00
Say	12,000.00

X. Other Expenses (per Month) :

	Rs.
1. Rent	350.00
2. Power, electricity, water etc.	200.00
3. Consumable Stores, Small tools	150.00
4. Transport, Packing and Conveyance	500.00
5. Contingencies	300.00
	<u>1,500.00</u>

XI. Working Capital (3 month's recurring expenses) :—

1. Salaries and wages	15,200.00
2. Raw Materials	36,000.00
3. Other Expenses	4,500.00
	<u>55,700.00</u>

XII. Capital Investment :

Fixed	60,000.00
Working	55,700.00
	<u>1,15,700.00</u>

XIII. Cost of Production (Annual)

1. Salaries and Wages	60,800.00
2. Raw Materials	1,44,000.00
3. Other expenses	18,000.00
4. Depreciation of m/c @10% per annum	6,000.00
5. Interest of Capital Investment @15% per annum	8,355.00
	<u>2,37,155.00</u>

XIV. Sales Proceeds (Annual) :

By Sales of Window Channels for Bus Body Windows @Rs. 75/- each without glass etc.—3600 nos. 2,70,000.00

XV. Profitability (Before Taxes) :

Profit = XIV—XIII

= Rs. 270000—237155 = Rs. 32845/-

The profit is 12% of Sales and 28.4% of Capital Investment.

XVI. Break Even Analysis :**Fixed Cost**

1. Depreciation of machinery	6,000.00
2. Interest on Capital Investment	8,355.00
3. Rent	4,200.00
4. 40% of Salaries and Wages	24,320.00
5. 40% of other expenses	7,200.00
	<u>50,075.00</u>

$$\begin{aligned} \text{Break Even Point} &= \frac{\text{Fixed cost} \times 100}{\text{Fixed cost} + \text{Profit}} \\ &= \frac{50075 \times 100}{50075 + 32845} \\ &= \frac{5007500}{82920} \\ &= 60\% \end{aligned}$$

XVII. Sources of Machinery and Raw Materials :**A. Rectifiers and Anodising plant**

1. Khandelwal Herman Electronics, Vandup Village Road, Vandup, Bombay-400078.
2. Canning Mitra Phoenix Ltd., Nachoobai Building, 187 Dr. D. N. Road, Bombay-400001.
3. Graner & Weil (India) Ltd., Sukh Sagar, Hughes Road Corner, Chowpatty, Bombay-400007.

B. Other Machines

1. International machine Tools Corporation, P.B. No. 799, Fort, Bombay-400023.
2. Regal Trading Co., Mehboob Building, Tilak Road, Ahmedabad-380001.
3. Maneklal & Sons, 23, Ganesh Chandra Avenue, Calcutta-700013.

C. Dyestuff For Anodising

1. Ciba of India Ltd., 14 J. Tata Road, Bombay-400020.
2. Khatau Vallabhdas & Co., India Globe Chambers, Fort, Bombay-400001.
3. Sandoz (India) Ltd., Annie Besant Road, Bombay-400018.

(Reserved item Sl. No. 623).

I. Product and its Uses

Wick stove is a very common household utility item. Since it is very simple and convenient to operate and since unlike Pressure Stove it is absolutely without any risk of accident due to bursting, its use is becoming more and more popular. To avoid elaborate and crude form of firing arrangement in coal-fired chulahs more and more people are changing over to the use of Wick stoves for cooking purpose. Even in the houses where coal chulahs are in use, Wick stoves are kept as stand by and for occasional light cooking purpose, heating of milk for children and for preparing tea, coffee etc. Since kerosene oil is available in every village for burning lamps, availability of this fuel is more assured to rural area than that of coal. Hence Wick Stoves have become popular in rural area as well.

II. Market potential

Since Wick-Stove is being used by most of the urban families and by a good number of rural families the magnitude of requirement for this item in domestic market of a country with about 600 millions of population can be well imagined. Working life of a Wick stove being about 3 to 5 years prospect of replacement is very high. This adds to the marketing prospect of this item. With the hectic activities in the field of oil exploration in India, it is expected that India will soon become self-sufficient in fuel oil. Thus prospect of easy availability of Kerosene oil will be brighter day by day and will continue to be so for many years to come. This fact well assures the marketing prospect of wick stoves. Because of this Govt. of India has come up with new design of wick stoves titled "NUTAN" and is trying to popularise its use throughout the country. Apart from the vast domestic market there is prospect of export of this item to a good number of developing countries where there is existing demand for this item.

Generally these are sold through distributors.

III. Production Target

Production target is fixed at 3,000 pieces of non-pressure wick stoves per month on the basis of single shift working and on average 25 working days per month.

IV. Product details and Process of Manufacture

Wick stove is manufactured out of sheet metals. It has got an oil container at the bottom with burning arrangement above it. It has got a simple mechanism for lifting the wick holder to control or put off the flame. Above the burning mechanism there is a stand to support the cooking pan. There is suitable mechanism to protect the flame, to have a controlled flow of air and also prevent radiation of heat generated by the burning of Kerosene oil so that maximum amount of heat is available for cooking purpose. All the components are manufactured by way of processing different gauges of plane iron sheets some black and some galvanised. Some components are made by suitable bending of M.S. wire. The operations involved are broadly as follows:

1. Shearing to size
2. Press tools operation like blanking piercing, deep drawing and forming
3. Roller bending
4. Spray painting.

V. Inspection and Quality control

Since the end product has got several components to be assembled together it is advisable to check them at every stage of operation. use of very simple gauges is necessary for the purpose. In press machines strict vigilance is necessary to assure quality of finish by way of proper setting of tools and timely maintenance of them.

VI. Land / Building

Office and Workshop covered area 250 sq. Meters rented £ Rs. 1,000/- per month.

VII. Machinery & Equipment

		Rs.
1. Power press (Hydraulic 75 Tons capacity.	1 No.	80,000-00
2. Ball Press No. 6, No. 4 and No. 2 each 1 No.	3 Nos.	2,500-00
3. Three roller sheet rolling machine motorised along with motor and electricals.	1 No.	4,000-00
4. Perforating machine motorised along with motor and electricals.	1 No.	5,000-00
5. Power Press 20 Ton capacity motorised along with motor and electricals.	1 No.	15,000-00

		Rs.
6. Treadle operated small shearing machine 36" capacity	1 No.	5,000.00
7. Cap threading machine motorised along with motor and electricals.	1 No.	3,000.00
8. Wire cutting machine (hand operated)	1 No.	750.00
9. Wire bending and forming fixture	1 No.	750.00
10. Top seaming machine (hand operated)	1 No.	3,000.00
11. Body seaming machine (hand operated)	1 No.	3,000.00
12. Spray painting equipment with spray gun, compressor along with standard accessories and electricals.	1 set	4,000.00
13. Initial stock of different Press Tools and hand tools.	L. S.	8,000.00
14. Stove enamelling chamber	1 No.	8,000.00
15. Installation and electrification		10,000.00
16. Furniture, fixture including office equipment and typewriter	L. S.	5,000.00
		<u>1,57,000.00</u>

VIII. Raw Materials (Per month)

1. C. R. C. A. sheet 28.30 swg 4 M. T. @ Rs. 4,000/— per M. T.	16,000.00
2. Galvanised plane sheet 30 swg. 300 Kg. @Rs. 4,500/— per M. T.	1,350.00
3. M. S. Wire 1/8" dia. 100 Kg. @Rs. 2.50 per Kg.	250.00
4. Bought out items like screws, nuts, wicks etc. L. S.	Rs. 400.00
	<u>Rs. 18,000.00</u>

IX. Staff & Labour (Per Month)

1. Manager	1 No.	800.00
2. Foreman/Supervisor	1 No.	600.00
3. Store Keeper/Accountant	1 No.	300.00
4. Skilled operators	3 Nos.	1,200.00
5. Semi-skilled workers	4 Nos.	1,000.00
6. Unskilled workers	5 Nos.	1,000.00
7. Wachman-cum-Peon	1 No.	200.00
		<u>5,100.00</u>
Cost of Labour benefits @ 10%		510.00
		<u>5,610.00</u>

X. Other Expenses (Per Month)

1. Rent	1,000.00
2. Electricity	200.00
3. Consumable tools	200.00
4. Oils & lubricants and other consumable stores	100.00
5. Maintenance	250.00
6. Cartage & freight	300.00
7. Packing cost	1,500.00

8. Publicity.	Rs. 500.00
9. Sales expenses including travelling	600.00
10. Stationery postage, Insurance, Legal charges, fees, licenses and other miscellaneous expenses.	350.00
	<u>5,000.00</u>

XI. Working Capital Required (Per Month)

1. Raw material	18,000.00
2. Staff & Labour	5,610.00
3. Other expenses	5,000.00
	<u>28,610.00</u>

XII. Total Capital Investment

1. Machinery & equipment.	1,57,000.00
2. Working capital for 3 months.	85,830.00
	<u>2,42,830.00</u>
Say	<u>2,43,000.00</u>

XIII. Cost of Production (Per Month)

	Rs.
1. Raw material	2,16,000.00
2. Staff & Labour	67,320.00
3. Other Expenses	60,000.00
4. Interest on capital @ 15%.	36,450.00
5. Depreciation on Machinery @ 10%.	15,700.00
	<u>3,95,470.00</u>

XIV. Total Sale (Per Annum)

1. By sale of 36,000 wick stoves 12.50 per piece	Rs. 4,50,000.00
2. By sale of scrap	L. S. 500.00
	<u>Rs. 4,50,500.00</u>

XV. Profitability (Per Annum)

Total sale-cost of Production = Profit.
 Profit—Rs 4,50,000 — Rs. 3,95,470 = Rs. 55,030

$$(a) \text{ Percentage of profit on sale} = \frac{5,080 \times 100}{4,50,000} = 12\% \text{ approx.}$$

$$(b) \text{ Percentage of return over investment} = \frac{55,080 \times 100}{2,43,000} = 22.6\% \text{ approx.}$$

XVI. Break Even Analysis

$$B. E. P. = \frac{\text{Annual Fixed cost} \times 100}{(\text{Annual fixed cost} + \text{Annual Profit})}$$

Fixed cost (Per annum)

	Rs.
1. Rent	12,000-00
2. Interest	36,450-00
3. Depreciation on M/s. & equipment	15,700-00
4. 40 % of salaries	26,928-00
5. 40% of other expenses (Excluding Rent)	19,200-00
	<u>1,10,278-00</u>

$$B. E. P. = \frac{1,10,278 \times 100}{(1,10,278 + 55,030)}$$

= 67 % approx.

XVII. Name / Addresses of Machinery Suppliers:

1. M/s. Atlas Works (P.) Ltd.,
119, Ripon Street,
Calcutta-16.
2. M/s. G. D. Iron & Metal Works,
D. B. Nanak Road,
Batala, Punjab.
3. M/s. Turner & Tools
15, Ganesh Chandra Avenue, (2nd Floor,
Calcutta-13.

(Reserved item S. No. 380).



I. Production & Its Uses

(a) Different types of wire brushes are available in the market and these are used by goldsmiths for cleaning the ornaments, by welders for removal of slag from weld line, by electricians for cleaning the surface for better electrical connections and by contractors for road construction and floor polishing jobs etc. The production of these brushes can be taken up with low capital. Machinery suggested in the scheme is very versatile and can easily handle all types of jobs with minor changes as per market demand.

(b) *Market Problems:* This is a consumable item, required for various applications. There is a good scope of further units in this line, if the quality and specifications are met with.

II. Production Targets

This scheme envisages a manufacture of 4800 dozens of Wire brushes per annum, at a value of approximately Rs 2 lakhs.

III. Production details & Process of Manufacture

The outlines of the process are:

1. Cutting & dressing of Wire
2. Preparation of handle
3. Fixing of wire on handle
4. Final assembly with the help of brush makers tools

IV. Quality control & standards

As per IS:3015-1964

V. Land & Building

Covered area 100 sq. ft. (rented)
Approximate Cost: Rs. 200/- PM

VI. Machinery & Equipment

Amount (Rs.)

- | | | |
|--|-----|----------|
| 1. Wire dressing & cutting machine with complete set of dies capable to cut and dress wire 0.5 mm to 5 mm with electric motor—1 HP | One | 4,500-00 |
| 2. Drying oven with air circulating for electric heating 3 KW Cap. | One | 5,000-00 |
| 3. Polishing & buffing machine with 1/4 HP electric motor. | One | 1,500-00 |

4. Brush makers tools e. g. Bench Shear Comb, Bristle Dispenser Wire cutters etc.	One set	Rs. 2,500-00
5. Misc. tools for glue preparation and application etc.		1,000-00
		14,500-00
6. Machinery installation charges @ 10 % of the cost of machinery.		1,450-00
7. Office furniture & fittings		4,000-00
Grand Total		19,950-00
	Say	20,000-00

VII. Raw Materials (Per Month)

- | | | |
|---|----------|----------|
| 1. MS Wire 0.5 mm to 3 mm @ Rs. 4,000/- MT 1.5 MT average 300 gms per pc. | | 6,000-00 |
| 2. Wooden handles assorted size average @ Rs. 4/- doz. | 400 doz. | 1,600-00 |
| 3. Rubber vulcanising soln, glue @ Rs. 5/- Kg. | 80 Kg. | 400-00 |
| 4. Polish for wooden handles | | 500-00 |
| | | 8,500-00 |

VIII. Staff & Labour (Per month)

Designation	No.	Salary	Amount (Rs.)
(a) Manager	1	600-00	600-00
(b) Typist	1	250-00	250-00
(c) Store Clerk	1	250-00	250-00
(d) Peon-cum-Chowkidar		50-00	150-00
(e) Skilled workers	3	250-00	750-00
(f) Unskilled workers	3	150-00	450-00
			2,450-00
Prerequisites @ 15% of salaries			370-00
			2,820-00

IX. Other Expenses (Per Month)

- | | |
|-------------------------|--------|
| 1. Rent | 200-00 |
| 2. Electricity & Water | 100-00 |
| 3. Postage & Stationery | 50-00 |
| 4. Consumable Store | 150-00 |
| 5. Repair & Maintenance | 50-00 |
| 6. Transport charges | 100-00 |
| Miscellaneous | 100-00 |
| | 750-00 |

X. Working Capital (For 3 Months)

Rs.

1. Raw materials	25,500.00
2. Salaries of staff and labour	8,460.00
3. Other Expenses	2,250.00
Total	36,210.00
Say	36,220.00

XI. Total Capital Investment

1. Machinery and Equipment	20,000.00
2. Working Capitals	36,220.00
	56,220.00

XII. Cost of Production (Per Annum)Salaries
of staff

33,840.00

1. Raw materials	1,02,000.00
2. Salaries of Staff & Labour	33,000.00
3. Other Expenses	9,000.00
4. Interest on total capital @ 15% per annum.	8,433.00
5. Depreciation on machinery tools, equipments etc @ 10% per annum.	2,700.00
Total	1,55,973.00
Say	1,56,000.00

XIII. Sales Proceeds

Rs.

By sale of 4800 dozens of wire brushes at
approximately Rs. 40/-- per dozen, 1,92,000.00

XIV. Profitability

Sales minus cost of production = profit
or 1,92,000—1,56,000 = 36,000/—

%age of profit over sales = $\frac{36,000 \times 100}{1,92,000} = 19\%$

%age of Return = $\frac{36,000 \times 100}{56,220} = 64\%$

XV. Break Even Point

B. E. P. = $\frac{\text{Annual fixed cost} \times 100}{\text{Annual sales} - \text{Annual variable cost.}} = 50\%$

XVI. Names & Addresses of Machinery & Equipment supplies.

- | | |
|---|------------------------------------|
| 1. M/s. Perfect Machine Tools,
44 E, Connaught Place,
NEW DELHI-1 | Wire Dressing &
Cutting machine |
| 2. M/s. Rajasthan Industries
Behind Old Power House
Jodhpur, Rajasthan | Polishing Machines |
| 3. M/s. Himalaya Electric Industries
(INDIA), 8711, Roshanara Road,
DELHI-7 | Drying Ovens |
| 4. M/s. Hindustan Furnaces,
Jyoti Bhawan, XII-26,
Veliyanoor,
TRICHUR-1. | |

(Reserved item Sl. No. 795.)

WIRE GAUGE AND WIRE NETTING METALLIC THICKER THAN 100 MESH SIZE

I. Product and Its uses

Wire gauge and wire netting fall under the category of builders' hardware. They are mostly of four categories viz., (1) Honey-comb wire netting (2) woven wire netting (3) Diamond wire netting and (4) crimped wire netting. Wires used for making them may be of Iron, Galvanised Iron, Copper, Brass or steel. Vinyl and Vinyl coated wires are also used. In this project only galvanised Iron wire is taken into consideration since that is used most extensively in this industry. This item has got many different uses of its own and also as raw material for making many industrial items. Some of the main uses are (1) Concrete Highway Anchorage, (2) Rice Polisher, (3) Window screen, (4) Coal sorting at mines (5) Screen or sieve, (6) Divider, (7) Guard for machinery etc.

II. Market Potential

Demand for wire nettings is on the steady increase in domestic market. With the country-wide increase in the activities on mining, processing of minerals and constructional work demand for wire netting is also increasing. Moreover, wire nettings require quick replacement. That too enhance the prospect of its marketing. Moreover, this item has got a good export market also.

III. Production Target

The project has got the following target of production per month based on single shift working and on average 25 working days per month :

1. Hexagona wire netting 3/4 size 250 rolls of 6 150 size.
2. Square wire netting 10, 14, 16, 18, 20 and 40 mesh assorted 50 Rolls of 3'1×00 size.

IV. Product Details and Process of Manufacture

In this project profile only the first two of the above four types of wire netting viz. Honey comb wire netting and woven wire netting have been taken into account considering the market demand. The details of each of the above two items of product are given below along with their process of manufacture :

(1) Honey Comb Wire Netting

This netting is so named because of its hexagonal design which resembles the honey comb. There are nine mesh sizes viz: 1/4", 3/8", 1/2", 5/8", 3/4", 1", 1 1/4", 1 1/2" and 2". In this Project Profile only 3/4" mesh size is taken since it has got the maximum demand in the market. This Honey-comb Wire Netting is produced on a special purpose machine called as "Hexagonal Wire Netting Machine". This type of netting can be produced in any desired width such as 1.5 ft, 2 ft. etc., upto 6 ft. The length may be as along as 200 ft. but 150 ft. is the most popular length in a roll. Wire of required gauge fed from a wooden bobbin is twisted together with another wire of same gauge from a spiral coil rod. The former wire has been supplied to the bobbin by means of Bobbin Winding Machine while the latter has been supplied to the spiral coil rod through a spiral coiling machine. The wires fed from a number of bobbins and from the corresponding number of special rods travel through the holes provided in the semi-circular pinion gear, rotating alternatively to become entwined with one another and this process is continued to weave a netting of hexagonal design.

(2) Woven Wire Netting

This netting is produced on the "Universal Wire Weaving Loom" and thus named so. This machine is used to fabricate netting of a small square design and may be of one type or another depending on the size of the mesh required in the final product. By varying the size of mesh or the type of material, a great many different types of nettings may be produced for as many different uses. The gauge of wire must not be too big, on the contrary, a netting having a mesh size as small as 120 may be fabricated from the wire of an extremely small gauge. In this project Profile "Woven wire Netting Machine" or Universal Wire Netting Machine-Types has been taken.

Woven wire netting is produced on this machine in the same manner as textile fabric is produced on the loom. The different is that yarns are replaced by metallic wires.

V. Inspection and Quality Control

Since these items are produced in special purpose machines inspection and quality control is

quite simple. The only raw material i.e. wires are available in standard gauges and quality. If the machines are set properly and worked with care standard product with desired quality will come out of it. However, only visual checking is necessary at certain intervals to check if the product is coming out of the machines in desired standard of finish or not.

VI. Land & Building

Office, workshop and store covered area
250 sq. metres rented @ Rs. 750/— per month.

VII. Machinery & Equipment

1. Hexagonal wire Netting Machine (for 3/4" size of mesh) with suitable Electric Motor 2 HP and Electricals.	1 No.	Rs. 37,000.00
2. Universal wire Netting Machine (10 to 30 Mesh size) with suitable electric motor 2 HP and Electricals.	1 No.	40,000.00
3. Spiral coil winding machine with 1/2 HP Motor and Electricals.	1 No.	6,000.00
4. Bobbin Winding Machine with suitable 1/2 H. P. Motor and Electricals.	1 No.	6,000.00
5. Bobbin Stand for 100 Bobbins	1 No.	3,000.00
6. Beaming carriage	1 No.	3,000.00
7. Installation and Electrification		10,000.00
8. Furniture, Fixture including office equipment and type writer.		5,000.00
		<u>1,10,000.00</u>

VIII. Raw materials (Per month)

G. I. Wire 20 to 40 S. W. G. 30 Metric Tons @ Rs. 6,000/— per M. T.	Rs. 1,80,000.00
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IX. Staff & Labour (Per Month)

1. Manager	1	800.00
2. Supervisor	1	500.00
3. Storekeeper-cum-Accountant-cum-typist.	1	300.00
4. Skilled operators	2	800.00
5. Semi-skilled workers	2	500.00
6. Un-skilled workers	2	400.00
7. Watchman-cum-Peon	1	200.00
		<u>3,500.00</u>
Cost of Labour benefits @ 10%		<u>350.00</u>
		<u>3,850.00</u>

X. Other Expenses (Per Month)

1. Rent	—	750.00
2. Electricity	—	250.00
3. Consumable, tools, oils, lubricants, and other consumable stores.	—	200.00
4. Maintenance	—	150.00

5. Cartage & freights	—	Rs. 750.00
6. Packing cost	—	600.00
7. Publicity	—	500.00
8. Sales expenses including travelling	—	500.00
9. Stationery, postage, Insurance, Legal charges, Fees, Licences and other miscellaneous.	—	300.00
		<u>4,000.00</u>

XI. Working Capital (Per Month)

1. Raw material.	—	Rs. 1,80,000.00
2. Staff & Labour	—	3,850.00
3. Other expenses	—	4,000.00
		<u>1,87,850.00</u>

XII. Total Capital Investment

1. Machinery & Equipment	—	Rs. 1,10,000.00
2. Working capital for 3 months	—	5,63,550.00
		<u>6,73,550.00</u>
Say		6,74,000.00

XIII. Cost of Production (Per Month)

1. Raw Materials	—	Rs. 21,60,000.00
2. Staff & Labour	—	46,200.00
3. Other Expenses	—	48,000.00
4. Interest on capital @ 15 %	—	1,01,000.00
5. Depreciation on Machinery @ 10 %		11,000.00
		<u>23,79,300.00</u>

XIV. Total Sale (Per Annum)

1. Hexagonal wire netting 3/4" size 3,000 Rolls of 6' x 150' size @Rs. 700/— per roll	—	21,00,000.00
2. Square wire netting 10 mesh, 14 Mesh, 16 Mesh, 18 Mesh, 20 Mesh and 40 Mesh assorted 600 Rolls of size 3' x 100' per roll @Rs. 675/— per roll	—	4,05,000.00
		<u>25,05,000.00</u>

XV. Profitability (Per Annum)

Total sale—cost of Production = Profit	
Profit = Rs. 25,05,000/- Rs. 23,66,300/— = Rs. 1,38,700/—	
(a) Percentage of profit on sale = $\frac{1,38,700 \times 100}{25,05,000}$ = 5.50 % approx	
(b) Percentage of Return on capital = $\frac{1,38,700 \times 100}{6,74,000}$ = 20.5 % approx	

XVI. Break Even Analysis

$$B. E. P. = \frac{\text{Annual Fixed cost} \times 100}{(\text{Annual Fixed cost} + \text{Annual Profit})}$$

Annual Fixed Cost

	Rs.
1. Rent	900· 0
2. Interest	1,01,100·00
3. Depreciation on Machinery & equipment	11,000·00
4. 40% of salary	18,480·00
5. 40% of other expenses (Excluding Rent)	15,600·00
	1,47,080·00

$$B. E. P. = \frac{1,47,080 \times 100}{(1,47,080 + 33,875)} = 80 \% \text{ approx.}$$

XVII. Name & Addresses of Machinery Suppliers

1. M/s. NASU Wire Machinery Manufacturing Co.
Station Road, PETNAD,
Gujrat.
2. M/s. Jain Eng' Works,
147, Netaji Subhas Road,
Calcutta-1.
3. M/s. Acme Metal Industries,
15/8 Narkeldanga North Road,
Calcutta-11.
4. M/s. Unity Wire Products,
40, Chetla Road,
Calcutta-27.

(Reserved item Sl. No. 491.)



I. Product & Its Uses

The wire nails are known to most of the people as it is widely used for fastening purposes. It is used for industrial as well as for domestic purposes. It is made of mild steel (Hard drawn Bright) wire with a head at one end and is pointed at the other end. The head will help to drive the nail with a hammer or for the Nail's removal. The pointed end will help for driving the nail into the items to be fastened.

II. Market Potential

The wire nails are required widely as stated above. They are in great demand for any wooden fabrication like packing cases, boxes, partitions etc. These are generally sold directly to consumers and indirectly through hardware merchants. The demand for wire nails will always be increasing.

III. Production Target

It is proposed to manufacture 25 Tons of wire nails of different gauges and different length per month.

IV. Production Details and Process of Manufacture

Coils of hard drawn bright wire is taken and fed to automatic wire making machines which are fitted with the proper heading dies, grips and cutting tool. In the machine, cold heading of the wire nail, head, cutting of the nail are done automatically and finished wire nails are thrown out. These wire nails are put in polishing drum alongwith saw dust, leather pieces and similar items and rotated to get polish on the wire nails. They are then packed as required and despatched.

V. Inspection and Quality Control

The nails shall be machine made and may have die marks on the neck. They shall be uniformly round in section, straight and shall have sharp points. The heads shall be properly formed and concentric with the shank.

VI. Land & Building

Covered Area 14 metres x 10 metres (Rented) Rs. 700.00 p.m.

VII. Machinery Equipment

		Rs.
(1) Wire nail making machine (Automatic) size 20 mm (3/4") to 75 mm (3") wire gauge 14 G to 9 G.	1 No.	15,000.00
(2) Wire nail making machine (Automatic) size 25 mm (1") to 100mm (4") wire gauge 14 G to 8 G.	1 No.	18,500.00
(3) Wire nail making machine (Automatic) Size 12mm (1/2") to 50 mm (2") wire gauge 14 G to 12 G.	1 No.	12,000.00
(4) Polishing barrel motorised with reduction gear arrangements	1 No.	6,000.00
(5) D. E. Bench grinder 12" wheel diameter	1 No.	3,000.00
(6) Tools & equipment		2,000.00
(7) Office furniture and equipment		5,000.00
(8) Installation & Electrification		5,500.00
		67,000.00

VIII. Raw Materials (Per Month)

		Rs.
1. Hard drawn bright wire 14 G to 8 G.	26 Tons	78,000.00

IX. Staff & Labour (Per Month)

1. Foreman	1 No.	600.00
2. Semi-skilled worker	1 No.	250.00
3. Unskilled worker	1 No.	200.00
4. Watchman/Helper	1 No.	200.00
5. Welfare facilities for staff & labour		250.00
		1,500.00

X. Other Expenses (Per Month)

	Rs.
1. Electricity & Water	300.00
2. Consumable tools, stores, oil etc.	300.00
3. Maintenance	100.00
4. Cartage and freight	500.00
5. Packing cost	400.00
6. Stationery, postage, etc.	200.00
7. Rent	700.00
	2,500.00

XI. Working Capital (Per Month)

1. Raw materials	78,000.00
2. Staff & labour	1,500.00
3. Other expenses	2,500.00
	82,000.00

XII. Total Capital Investment

	Rs.
1. Machinery & Equipment	67,000.00
2. Working capital for three months	2,46,000.00
	3,13,000.00

X III. Manufacturing cost (Per Month)

	Rs.
1. Raw Material	78,000-00
2. Staff & labour	1,500-00
3. Other expenses	2,500-00
4. Depreciation on machinery & equipment @ 10% p. a.	560-00
5. Interest on Capital Investment @ 15% per annum	3,910-00
	86,470-00
Say	
	86,500-00

XIV. Total Sales (Per Month)

By sale of 25 tons of wire nails of different sizes at an average price of Rs. 3700/— per ton.

92,500-00

XV. Total Profit per Month.

Profit = Total Sales—Manufacturing cost.
= 92500—86500
= Rs. 6000/- per month.

(a) Percentage of profit on sales :
Profit per month.

$$= \frac{\text{Sales per month.}}{6000} \times 100$$

$$= \frac{92500}{6000} \times 100$$

$$= 6.48\%$$

(b) Percentage of profit on investment.
Profit per annum

$$= \frac{\text{Total Investment}}{6000 \times 12} \times 100$$

$$= \frac{3,13,000}{72000} \times 100$$

$$= \frac{3,13,000}{72000} \times 100$$

$$= 23\% \text{ (approximate)}$$

XVI. Break Even Analysis

Break even point = Annual fixed cost

Annual fixed cost + Annual profits

Fixed cost per month

	Rs.
1. Rent	700-00
2. 30% of labour	750-00
3. 50% of other charges excluding rent.	900-00
4. Depreciation on machine.	560-00
5. Interest on capital	3,910-00
	5,820-00

$$\begin{aligned} \text{Annual fixed cost} &= \text{Fixed cost per month} \times 12 \\ &= 5820 \times 12 \\ &= \text{Rs. } 69840-00 \end{aligned}$$

Break even Percentage :

$$\begin{aligned} &= \frac{\text{Annual fixed cost}}{\text{Annual fixed cost} + \text{Annual profit}} \times 100 \\ &= \frac{69840}{69840 + 72000} \times 100 \end{aligned}$$

$$\begin{aligned} &= \frac{69840}{1,41,840} \times 100 \\ &= 49.25\% \end{aligned}$$

XVII. Name and Addresses of suppliers of Machinery & Equipment

1. M/s. Bunnra Industrial Corporation,
G. T. Road, Patilghar,
AMRITSAR (Punjab.)
2. M/s. National Wire Products.
6, Rajput para,
RAJKOT-1 (Gujarat).
3. M/s. International Machine Tool Corporation,
5, Bank Street, Behind State Bank of India, Fort,
BOMBAY-400023.

XVIII. Name & Addresses of Raw Material Suppliers.

1. M/s. Mehta Mannal Chenmalji & Co.,
87-89, Kika Street,
BOMBAY-400008.
2. M/s. Eastern Wire products,
222, Manicktolla Main road,
Calcutta-11.
3. M/s. Accurate Wire Industries,
2392 Hakim Bazar Street,
Delhi-6.

4. Andhra Industrial Works,
Industrial Estate,
Cuddaph (A. P.)

5. Raj Traders (India),
Indl. Estate, Pologround,
Indore-452003.

(Reserved item SL No. 457).

L (a) Product & Its Uses

Wood Screws fall under the class of Industrial Fasteners. These are mainly used in wooden furniture, packaging industry, electrical fittings and railway carriages. These are also used in building construction work and repair work.

There are several sizes of Wood Screws depending mainly on their utility and need and various constructional activities. These are generally available with counter-sunk head, round head and raised counter-sunk head.

(b) Market Potential

Presently the market of Wooden Screw is highly competitive. However with the increase in the consumption of this item and if the same is produced as per ISI standards, there is also great scope for export market.

Wooden Screws are most common in use. As such, every state provides a sizeable market of this product. However, Bombay, Calcutta, Delhi & Madras are more conspicuous as consumption and distribution centres. State Government & Central Government as well as their undertaking are also major consumers of this product.

These are usually marketed through the wholesale dealers and they supply to the retailers and other consumers in the field.

II. Production Target (Per Annum)

(a) Quantity	75,000 Gross
(b) Value	Rs. 7,50,000-00

III. Product Details and Process of Manufacture

The details worked out for the manufacture of Wood Screws have been based on the ISI No. 451-1972.

The process of manufacture is as under :—

- the wire is fed to an automatic heading machine where the head is formed and parting off done according to desired length.
- the slotting on head is made on slotting machine.
- the threading is done on thread cutting machine.

The screws are then degreased, pickled and polished in the polishing drums and then packed in the cartons.

IV. Inspection & Quality Control

- Material should be used as per IS : 1812-61.
- Tensile test should be according to IS : 1521-1960.
- Bend test*, wires 5 mm or above in dia and above shall be subjected to bend test. The wire when bent through an angle of 90° round a radius equal to its own diameter shall withstand the test without breaking or splitting.
- Wrapping test*, wires below 5 mm dia shall be subjected to wrapping test. The wire when wrapped eight times round its own diameter being subsequently straightened shall withstand the test without breaking or splitting.
- The head should be concentric with the thread.
- The slot is required to be in the centre of the head.
- The wood screws should be tapered at the beginning of the thread for easy insertion and tightening.
- The design of the screw should be according to the specification laid down by ISI.

V. Financial Aspects

1. Fixed Capital

(i) Land and Building	Rented
Covered area 200 sq. meter @ Rs. 10/- per sq. meter	Rs. 2,000-00(P.M.)

(ii) Machinery and Equipment

(a) Production Unit

Sl. No.	Description	Indigenous/ Imported	Qty	Price (Rs.)
1.	Heading m/c Cap. from No. 10 to 16 & length 30 mm to 75 mm.	Indigenous	1	40,000-00
2.	Heading m/c cap. from No. 3 to 8 & length from 8 mm to 35mm	"	1	25,000-00

			Rs.
3. Slotting m/c Light duty	Indigenous	1	14,000.00
4. Slotting m/c Heavy duty.	"	1	17,000.00
5. Threading m/c Light duty.	"	4	60,000.00
6. Threading m/c Heavy duty.	"	4	50,000.00
7. Polishing drums	"	2	5,000.00
8. Pickling & Cleaning Vats	"	6	6,000.00
9. Weighing scale	"	1	5,000.00
			2,22,000.00

(b) Testing Equipment:

Measuring instruments such as micro-meter, V. Caliper Gauges etc. 2,000.00

(c) Electrification and Installation 22,000.00

2,46,000.00

(iii) Cost of fixtures/dies 5,000.00

(iv) Cost of office equipment/working tables etc. 5,000.00

(v) Pre-operative expenses 3,000.00

Total fixed capital (ii), (iii), (iv) & (v) 2,59,000.00

2. working Capital (Per month)

(i) Personnel :

Designation	No.	Salary	Total (Rs.)
(Administrative & Supervisory)			
1. Manager	1	1000	1,000.00
2. Accountant-cum-Storekeeper	1	500	500.00
3. Clerk-cum-Typist	1	300	300.00
4. Peon/Chowkidar Technical-skilled & Unskilled	3	200	600.00
5. Foreman	1	800	800.00
6. Skilled Workers	2	400	800.00
7. Semi-skilled workers	2	300	600.00
8. Helper	4	200	800.00
Total (Salaries)			5,400.00
(+) Perquisites @ 15% of Salaries			800.00
			6,200.00

(ii) Raw materials including Packaging requirements (Per Month)

Particulars	Indigenous/ Imported	Qty	Rate (Rs.)	Value (Rs.)
1. Hard bright M. S. wire 3 to 14 swg.	Indigenous	7.5 M. tons	3000/- per M. ton	22,500.00
Polishing material	"			2,500.00
Packing cartons	"			5,000.00
				30,000.00

(iii) Utilities (Per month)

Power 500.00
Water 50.00
550.00

(iv) Other contingent expenses (Per month)

	Rs.
1. Rent	2,000.00
2. Postage & Stationery	100.00
3. Telephone	250.00
4. Consumable stores	250.00
5. Repairs & Maintenance & Dies	1,250.00
6. Transport charges	500.00
7. Advertisement	250.00
8. Insurance	100.00
9. Taxes	100.00
10. Sales expenses	1,000.00
Total	5,800.00

(v) Total recurring expenditure (P.M.) 42,550.00

(vi) Total working capital (on 3 months basis) 1,27,650.00

3. Total Capital Investment

(i) Fixed capital 2,59,000.00

(ii) Working capital for 3 months 1,27,650.00

3,86,650.00

4. Cost of Production (Per month)

1. Total recurring cost per year	5,10,600.00
2. Depreciation on machinery & equipment	22,200.00
3. Depreciation on Dies/Fixtures @ 25%	1,250.00
4. Depreciation on measuring instrument @ 20%	400.00
5. Depreciation on office equipment @ 15%	750.00
6. Interest on total investment @ 15%	58,000.00
	5,93,200.00

5. Turn over (per year)

Item	Qty	Rate	Value (Rs.)
Wood Screws (Assorted sizes)	75000 Gross	@ Rs. 10/- per gross	7,50,000.00
6. Net profit per year (5-4)			7,50,000.00
			5,93,200.00
			1,56,800.00

7. Net profit ratio 20%

8. Rate of return 45%

9. Break even point 50%

10. Address of Machinery suppliers

1. M/s. Universal Screw Factory (P) Ltd., Chhacharta, Amritsar.
2. M/s. Bharat Industrial Corpn. 6/C, Colling Street, Calcutta-16.
3. M/s K. B. Machine Factory 5 Harnam Singh Ramgarhia Marg Amritsar.
4. M/s. Sagar Engineering Corpn. G.T. Road, Ram Talai Amritsar.
5. M/s S. S. Sabharwal & Sons 664, Military Road, New Delhi.

Address of Raw material

Can be procured from local market.

(Reserved item S. No. 459).

I. Products and Their Uses

Wooden frames and shutters are required in every house hold constructions, Government and other institutional buildings. Previously, whenever a house was constructed, carpenters also used to be engaged for the manufacture of Doors, Windows and Shutters etc. It requires considerable skill and time. Due to high labour cost non-availability of skilled labour and requirement in bulk these days, the trend is to purchase ready-made items.

II. Market Potential

The Government's policy is to provide housing shelters to as many people as possible. The State Government have set up housing development boards to make houses and give them and on hire purchases basis. Due to the various developmental projects, there is a big spurt in the Government and other Institutional construction activity. Thus, there is a huge demand for the door frame, windows etc.

III. Production Target

The scheme envisages the manufacture of 28,000 sq. ft. of Door frames and shutters.

IV. Production Details

Log timber is the raw-material for the industry. Suitable sizes of planks will be cut on the bend saw machine. These are cut to required sizes on hand saw and circular saw depending upon the size. They are then surface planed to required thickness on the thickness planner. The edge forming, drilling holes and moulding operations are done on the respective machines. The different items are then glued and assembled.

V. Land and Building

	Rs.
1. Land 400 sq. meters @Rs. 40/- per sq. meter.	16,000-00
2. Covered shed 200 sq. meter @Rs. 200/-	40,000-00
	56,000-00

VI. Machinery and Equipment

	Rs.
1. Band saw machine 36" with Motor 10HP	4,500-00
Circular saw 12" with 2 HP motor	2,000-00
3. Surface-cum-thickness planer machine with motor 2 HP.	5,500-00

	Rs.
4. Jointer planer 12" with motor 2 HP.	9,500-00
5. Moulding Spindle machine 20" x 24" size	4,400-00
6. Tenoning machine with motor 5 HP	6,000-00
7. Belt sander machine with motor 3 HP	6,500-00
8. Mortising chain chisel Machine with motor and 1/2" to 1" size chain and motor 1HP.	3,400-00
9. Saw sharpening machine with motor 1 HP	4,000-00
10. Saw Brazing machine (Electrically operated).	2,000-00
11. Double ended grinder machine with 3/4" HP motor.	800-00
12. Portable drill 12" Capacity with stand	800-00
13. Knife sharpening machine with 1/2 HP motor	1,000-00
14. Hand tools—10 sets	4,000-00
15. Work tables—10 Nos	4,000-00
16. Office equipment and Electric installation Charges	3,900-00
	62,000-00

VII. Staff & Labour (Per Month)

	Rs.
1. Foreman Incharge	800-00
2. Machine Operators	3,200-00
3. Skilled workers	3,400-00
4. Semi-skilled Workers	1,800-00
5. Labourers	1,000-00
6. Clerks	600-00
7. Watchman	400-00
8. Helpers	800-00
	12,000-00

VIII. Raw Material (Per Month)

	Rs.
1. Wood 200 Cft @ 42.50 per cft	8,500-00
2. 2 Ply wood of various kinds	2,500-00
3. Hinges and other fittings etc.	2,500-00
4. Polish & Paint Materials	2,500-00
	16,000-00

X. Other Expenses (Per Month)

1. Electricity & Water charges	400-00
2. Transport and Cartage	100-00
3. Sand Belts, Sand Papers etc	250-00
4. Oils, Lubricants and other consumables	200-00
5. Postage and Stationery	50-00
6. Miscellaneous expenses	200-00
	<u>1,200-00</u>

X. Working Capital for 3 Months]

	Rs.
1. Raw materials	48,000-00
2. Salaries and wages	36,000-00
3. Other expenses	3,600-00
	<u>87,600-00</u>

XI. Total Capital Investment

	Rs.
1. Land and building	56,000-00
2. Machinery & equipment	62,000-00
3. Working capital for 3 months	87,000-00
	<u>2,05,600-00</u>
Say	<u>2,06,000-00</u>

XII. Cost of Production Per Annum

	Rs.
1. Raw materials	1,920 00-00
2. Salaries and wages	1 44,000-00
3. Other expenses	14,400-00

	Rs.
4. Interest on capital @15% per annum	24,700-00
5. Depreciation on machines @ 10% p.a.	6,000-00
6. Depreciation on building @ 5% p.a.	2,000-00
	<u>3,83,100</u>
Say	<u>3,83,000-00</u>

XIII. Sales Proceeds

By sale of approximately 28,000 sq ft of doors, windows, cup boards etc. with shutters & fittings @Rs. 16-59 per sq ft. Rs. 4,62,000-00

XIV. Profitability

1. Sales minus cost of production = profit or 4,62,000—3,83,000 = 79,000
2. Percentage of profit on sales = 17% approximately
3. Return on capital = 38% approximately

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed cost} \times 100}{\text{Annual Sales} - \text{Annual variable cost}} = 58\%$$

XVI. List of Suppliers of Machinery

1. M/s Sugga Engineering Works (P) Ltd;
8/39, South Industrial Area,
Kirti Nagar,
NEW DELHI-15
2. M/s Sonic Machine Tools,
10, Industrial Estate,
Rajkot (GUJARAT).
3. M/s The Bharat Mechanical Works (Rd),
GT Road,
BATALA
4. M/s Ramanuja Industries
Kannamangalam,
TRICHUR.

I. Product and its Use

Name of the product itself explains that it is used for covering the sewing machine. Sewing machine manufacturer in general does not produce the timber based components for the machine, such as, base board, drawer and the cover. These are usually procured from outside manufacturer.

II. Market Potential

Sewing machine has got established market in the country and are being exported in bulk. With the improvement of purchasing power of the people, the market for sewing machine is also expanding. It is expected that with gradual improvement in the living standard, demand for sewing machine will also go up both in the domestic & export market. Hence manufacturer of sewing machine cover should find enough demand from machine manufacturer and also in the replacement market.

III. Production Target

The project is for manufacture of 1000 nos. of Sewing machine cover per month 12000 nos. per annum.

IV. Production Detail & Process of Manufacture

It has been assumed in the project that veneer of specified sizes will be procured from actual manufacturer. Face veneer is generally of champ or similar timber the bottom and the core veneer may be of Mangoer similar timber. After application of resin the veneer set is hot pressed in the machine for forming the body cover. The block boards for the side ends are shaped in the universal machine. The battens are also sized in the same machine. The ply body is transferred to end press and end boards along with the battens are pressed after application of resin with the ply body. After drying the cover is finished by polishing and fittings are fixed into it.

V. Inspection & Quality Control

At the initial stage all incoming raw materials are checked to avoid use of defective materials. In process components have to be checked to ensure proper workmanship and dimensional

measurement. Templates and measuring scales may be provided to operators for checking forms and dimensions. No critical inspection is called for except dimensional checks for this product.

VI. Land & Buildings

1. Covered area-200 sq. Mtr	} Rented.
2. Uncovered area-100 Sq. Mtr.	

VII. Plant & Machineries

	Rs.
1. Heavy duty Universal wood working machine with 3 H.P. Motor & accessories. 1 No.	18,000-00
2. Hot press for sewing machine cover ply Pasting & Bending complete with Electrical heaters, switch, etc. 1 No.	10,000-00
3. End Press (To be fabricated) 1 No.	2,000-00
4. Fixture & Tools etc. L.S.	2,500-00
5. Office equipment & furniture L.S.	1,500-00
6. Installation & Electrification L.S.	3,000-00
	37,000-00

VIII. Raw Material (Per Month)

	Rs.
1. Veneer Mango/Champ @ Rs. 4-00/set. 1000 Sets	4,000-00
2. End Board @ Rs. 3-00/set "	3,000-00
3. Battens @ Rs. 0-75/set "	750-00
4. Resin (ready mixed) @ Rs. 1-00/set "	1,000-00
5. Fittings @ Rs. 2-00/set "	2,000-00
6. Polishing material @ Rs. 2-00 set "	2,000-00
	12,750-00
Say Rs.	12,800-00

IX. Salary & Wages (per month)

	Rs.
1. Manager 1 No.	800-00
2. Supervisor 1 No.	400-00
3. Office Assistant 1 No.	300-00
4. Watchman 1 No.	200-00

	Rs.
5. Skilled operator 2 Nos.	600·00
6. Polisher 1 No.	600·00
7. Semi Skilled Labour 2 Nos.	500·00
8. Labour 4 Nos.	800·00
	4,200·00
Cost of Labour Benefit @ 10%	420·00
	4,620·00
Say Rs.	4600·00

X. Other Item of expenditure (per month)

	Rs.
1. Rent	750·00
2. Electricity	500·00
3. Consumable stores	200·00
4. Maintenance	200·00
5. Transport	500·00
6. Packing & forwarding	500·00
7. Publicity	100·00
8. Sales expenses	200·00
9. Stationery	100·00
10. Misc.	200·00
	3,250·00
Say Rs.	3,300·00

XI. Working capital (Per month)

	Rs.
1. Raw material	12,800·00
2. Salary & Wages	4,600·00
3. Other expenses	3,300·00
	20,700·00

XII. Capital Investment

	Rs.
1. Block Capital	37,000·00
2. Working Capital for 3 months	62,100·00
	99,100·00

XIII. Cost of Production (per annum)	Rs.
1. Raw material	1,53,600·00
2. Salary & Wages	55,200·00
3. Other expenses.	39,600·00
4. Interest on capital @ 15%	14,300·00
5. Depreciation of machinery @ 10%	3,700·00
	2,66,400·00

XIV. Total Sale (per annum)

By Sale of 12000 Sewing machine cover @ @ 24·00 each	Rs. 2,88,000·00
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XV. Profitability (per annum)

1. Total Sale	2,88,000·00
2. Cost of Production	2,66,400·00
Profit	21,600·00

(a) Percentage of Profit on sale = $\frac{\text{Rs. } 21600 \times 100}{2888000} = 8\% \text{ approx.}$

(b) Do. on Capital = $\frac{21600 \times 100}{99100} = 22\% \text{ approx.}$

XVI. Break even analysis

$$\text{BEP} = \frac{\text{Annual fixed Cost} \times 100}{\text{Annual fixed cost \& Annual Profit}}$$

Annual fixed cost	Rs.
1. Rent	9,000·00
2. Interest	14,300·00
3. Depreciation on M/cs.	3,700·00
4. 40% of Salary	22,080·00
5. 40% of other expenses	15,840·00
	64,920·00
Say Rs.	65,000·00

BEP = $\frac{65000 \times 100}{65000 + 21600} = 74\% \text{ approx.}$

XVII. Names & address of machinery suppliers

1. M/s. Batliboi & Co. Ltd.,
P.O. Box 190A, Dr. V.B. Gandhi Marg,
Fort, Bombay-23.
2. M/s. S.S. Industries,
25, Marquis Street,
Calcutta-16.

(Reserved item Sl. No. 41)

I. Product and its Uses

Shelves and racks are used to keep and store the articles i.e. book, records etc. in a better manner so that they are readily available in time. Wooden storage shelves and racks are mainly used in shops & offices. It has got certain advantage, particularly in the display of products, over steel shelves & racks, which makes it more popular.

II. Market Potential

Wooden storage shelves & racks always enjoy a ready market because of its multipurpose use and easy maintenance.

III. Production Target

This scheme envisage an annual production of 120 nos. of Wooden Shelves and 240 nos. of rack of 6'x6'x1½'. The requirement of plank will be 360 cft. of haldu or similar wood and sal wood of different cross section approx. 180 cft. for frames.

IV. Production Details and Process of Manufacture

Planks and other wood are procured from the local market. They are seasoned in the open air as per requirement. Later on when the unit is well set and has become a remunerative enterprise kiln seasoning unit could be attached for speedier and efficient seasoning. The planks and other woods are surfaced and cut to the required sizes in respective machines provided. The parts are then joined together with the help of nails wooden pin, glue etc. as deemed fit for the end product. Finishing and painting are done as per the requirement of the customers.

V. Inspection & Quality Control

Wooden storage shelves & racks are generally manufactured as per customers' specification and design. Actual working of the product, joints and finish are the main criteria for these kind of products. However ISI specification is available for these products. Standard measuring tools such as tape, scale, ordinary templates are generally used in this line manufacturing.

VI. Land & Building

	Rs.
1. Land—25 Mt. × 15 Mt.	RENTED 500.00
2. Covered area 15 Mt. × 8 Mt.	

VII. Machinery & Equipment

1. Hand feed surface planer complete with guide fence, blade guard electric motor, starter etc.	1 no.	4,500.00
(a) Cutter head diameter 60mm		
(b) Table size—500 × 700 mm		
(c) HP required—1 H.P.		
2. Heavy duty circular saw machine with table and saw guard electric motor, starter etc.	1 no.	2,500.00
(a) Diameter of saw blade-300mm		
(b) Max. Dept of cut—110mm		
(c) HP required—1 H.P.		
3. 1/2" capacity portable drill (wolf brand)	1 no.	2,000.00
4. 18" knife grinding machine with 1/2 HP motor & starter etc.	1 no.	1,500.00
5. Electrical installation, power and light	L.S.	2,000.00
6. Carpentry hand tools	L.S.	1,000.00
7. Furniture for workshop and office equipment	L.S.	3,000.00
		16,500.00

VIII. Raw Materials (Per Month)

	Rs.
1. Wooden plank 30 cft. Haldu or similar	@Rs. 60/- per cft. 1,800.00
2. Sal wood of various cross section 150 cft.	@Rs. 50/- per cft. 7,500.00
3. Varnish and other polishing material	L.S. 700.00
	10,000.00

IX. Staff & Labour (Per Month)

	Rs.
1. Supervisor	1 no. 600.00
2. Carpenter	2 nos. 600.00
3. Machine operator	3 nos. 900.00
4. Helper	4 nos. 600.00
5. Watchman	1 no. 200.00
	3,100.00
6. Labour benefit @ 10%	310.0
	3,310.0

X. Other Expenses (Per Month)

	Rs.
1. Rent	500.00
2. Electricity	100.00
3. Consumable tools	100.00
4. Cartage & freight	300.00
5. Packing & forwarding	200.00
6. Publicity	200.00
7. Maintenance	100.00
8. Other consumable oil lubricants	200.00
9. Sales expenses including travelling	500.00
10. Stationery, postage, insurance etc.	100.00
	<u>2,300.00</u>

XI. Working Capital (Per Month)

	Rs.
1. Raw material	10,000.00
2. Staff & labour	3,410.00
3. Other expenses	2,300.00
	<u>15,710.00</u>
Say Rs.	<u>15,800.00</u>

XII. Total Capital Investment

	Rs.
1. Machinery & equipment	16,500.00
2. Working capital for 3 months	47,400.00
	<u>63,900.00</u>

XIII. Cost of Production (Per Annum)

	Rs.
1. Raw material	1,20,000.00
2. Staff & labour	40,920.00
3. Other expenses	27,600.00
4. Interest on capital investment @ 51 %	9,585.00
5. Depreciation on machinery & equipment @ 10 %	1,650.00
	<u>1,99,755.00</u>
Say Rs.	<u>2,00,000.00</u>

XIV. Total Sale (per Annum)

	Rs.
1. 120 nos. of Wooden shelves @Rs. 800/- per piece	96,000.00
2. 240 nos. of Wooden Rack @ Rs. 500/- per piece.	1,20,000.00
	<u>2,16,000.00</u>
3. By sale of Waste wood . . L.S.	2,000.00
	<u>2,18,000.00</u>

XV. Profitability

	Rs.
Total Sale	2,18,000.00
Cost of production	2,00,000.00
	<u>18,000.00</u>

$$1. \text{ Percentage of profit on sale. } \frac{\text{Annual profit} \times 100}{\text{Annual sale}} = \frac{18,000 \times 100}{2,00,000} = 9\%$$

$$2. \text{ Percentage of return over capital } \frac{\text{Annual profit} \times 100}{\text{Capital investment}} = \frac{18,000 \times 100}{63,900} = 28.1\% \text{ approx.}$$

XVI. Break Even Point Analysis

$$\text{BEP} = \frac{\text{Annual Fixed cost} \times 100}{\text{Annual fixed cost} + \text{Annual profit}}$$

Annual fixed cost :

	Rs.
1. Rent	6,000.00
2. Interest	9,585.00
3. Depreciation on machinery & equipment	1,650.00
4. 40 % of salary	16,400.00
5. 40 % of other charges	11,040.00
	<u>44,675.00</u>
Say Rs.	<u>44,700.00</u>

$$\text{BEP} = \frac{44,700 \times 100}{44,700 + 18,000} = 71\% \text{ approx.}$$

XVII. Name and Address of Machine Supplier

1. M/s. Varat Machinery,
28B, Shakespeare Sarani, Calcutta-17.
2. M/s. Jaynues Machinery,
22 Brabourne Road, Calcutta-1.
3. M/s. Batliboi & Co. Pvt. Ltd.,
Jeewan Vihar, Parliament St., New Delhi.
4. M/s. Rama Industries, Rewari, Haryana.

(Reserved item Sl. No. 49)

I. Product & its Uses

Furniture & Fixture are essential for a family. Furniture and Fixtures proposed to be manufactured in this scheme are made out of wood specially from CP Teak, Chap, Haldu, Jack or similar good quality wood. With the modern life Furniture and Fixture used in a family are wide and varied in nature starting from plank, almirah table, chair, rack, meatsafe and what not. Apart from utility furniture made out of good quality wood and highly finished add beauty to the room.

II. Market Potential

Wooden furniture fixtures always enjoy a ready market and selling quality furniture with elegant get up should find no difficulty in consumer market.

III. Production Target

This scheme envisage annual production target of Plank (wooden cot)-15 Nos. Almirah 50 Nos. Table 600 Nos., Chair 1000 Nos., Rack 120 Nos. approximately. Total requirement of plank and other wood will be nearly 3000 cft.

IV. Production details and process of manufacture

Plank and other wood are procured from the local market. They are seasoned in the open air as per requirement. Later on when the unit is well set and has become a remunerative enterprise Kiln Seasoning unit could be attached for speedier and efficient seasoning of the plank. The planks are then planed and cut in the cross cutting machine to the required length. Required design and curvings are made on the planks where necessary. The parts are then joined together with the help of special nail having both ends pointed, wooden pin, glue etc. as deemed fit for the end product. Products thus made are then polished varnished & finished. They are then ready for despatch.

V. Inspection & Quality Control

Wooden furniture and fixture are generally manufactured as per customers' specification & design. Actual working of the product, colour & finish are the main criteria for these kind of

products. However ISI specification is available for these products and bulk orders are required to be supplied according to these specification. Standard measuring tools such as tape-scale, ordinary templates are generally used in this line of manufacturing. Care should also be taken to avoid use of defective timber.

VI. Land and Building

Rs.

- | | | |
|-----------------------------------|----------|------------|
| 1. Land 30 Mtr × 20 Mtr | } Rented | 500.00p.m. |
| 2. Covered area 20 Mts. × 10 Mtr. | | |

VII. Machinery & Equipment

1. Heavy duty vertical Bandsaw machine complete with electric motor suitable for 440/3/50 cycles supply starter, vee belt	1 No.	6,000.00
(a) Dia of wheels — 18" 450 mm		
(b) Width of wheels 1 1/2" 38mm		
(c) H.P required—3 H.P.		
2. Hand Feed Surface planer complete with guide fence, blade guard, cutter block with 3 steel knives complete electric motor starter, pulley & Belt	1 No.	4,500.00
(a) Cutter Head diameter 60 mm		
(b) Table size 500 × 170 mm		
(c) H.P. Required	1 H.P.	
3. Indigenous make ball bearings fitted heavy duty Motorised circular saw machine with heavy machined table, saw guard with electric motor Starter, Vee belt etc.	1 No.	2,500.00
(a) dia of saw made—300mm		
(b) Mx. depth of cut 110 mm		
(c) H.P. required 1 H.P.		
4. 1/2" capacity portable Drill (Wolf Brand)	1 No.	2,000.00
5. Portable Heavy duty sander 6" (Wolf Brand)	1 No.	1,500.00
6. Saw sharpner and setter with 1/2 H.P. motor starter etc.	1 No.	3,500.00
7. Hot Iron Brazing Equipment with stand & Forge	1 No.	1,000.00
8. 18" Knife grinding machine with 1/2 H.P. motor & Starter etc.	1 No.	1,500.00
9. Electrical Installation, Power and Light	L.S.	4,000.00
10. Carpentry Hand Tools	L.S.	1,000.00
11. Furniture for Workshop and office equipment		3,500.00
		31,000.00

VIII. Raw material (per month)

	Rs.
1. Plank & Other woods 250 Cft CP Teak, chap. haldu Jack, wood and similar @ Rs. 60/- per cft	15,000.00
2. Nail, Sand paper	300.00
3. Foam Plywood, rexine, glue et	3,000.00
4. Varnish & Other Polishing material	1,200.00
	<u>19,500.00</u>

IX. Staff & Labour (per month)

	Rs.
1. Manager 1 No.	600.00
2. Clerk 1 No.	300.00
3. Carpenter 2 Nos.	800.00
4. Machine Operator 5 Nos.	1,500.00
5. Unskilled labour 6 Nos.	1,200.00
6. Watchman 1 No.	200.00
	<u>4,600.00</u>
7. Add labour benefit cost @ 10%	460.00
	<u>5,060.00</u>
Say Rs.	<u>5,100.00</u>

X. Other Expenses (per month)

	Rs.
1. Rent	500.00
2. Electricity	200.00
3. Consumable stores	100.00
4. Maintenance	200.00
5. Cartage and freight	300.00
6. Publicity	200.00
7. Packing & Forwarding	300.00
8. Other consumable oil & lubricants	200.00
9. Sales Expenses including travelling	400.00
10. Stationery, postage, insurances etc.	100.00
	<u>2,500.00</u>

XI. Working Capital (per month)

	Rs.
1. Raw Material	19,500.00
2. Staff and Labour	5,100.00
3. Other Expenses	2,500.00
	<u>27,100.00</u>

XII. Total Capital Investment

	Rs.
1. Machinery and Equipment	31,000.00
2. Working Capital for 3 months	81,300.00
	<u>1,12,300.00</u>

XIII. Cost of Production (per annum)

	Rs.
1. Raw material	2,34,000.00
2. Staff and Labour	61,200.00
3. Other Expenses	30,000.00
4. Interest on capital investment @ 15%	16,845.00
5. Depreciation on machinery and Equip- ment @ 10%	3,100.00
	<u>3,45,145.00</u>

XIV. Total sale (per annum)

	Rs.	Rs.
1. Ahmirah 50 Nos. @900/-		45,000.00
2. Table—600 Nos. @200		1,20,000.00
3. Chair—1000 Nos. @90/-		90,000.00
4. Plank /Cot 15 Nos. @600/-		90,000.00
5. Rack 120 Nos. @200/-		24,000.00
		<u>3,69,000.00</u>
By sale of waste wood		5,000.00
		<u>3,74,000.00</u>

XV. Profitability (per annum)

Total sale	3,74,000.00
Cost of production	3,45,145.00
	<u>28,855.00</u>

$$(a) \text{ Percentage of Profit on sale } = \frac{\text{Annual profit} \times 100}{\text{Annual sale}} = \frac{28855 \times 100}{37400} = 7.9\% \text{ approx.}$$

$$(b) \text{ Percentage of return on capital } = \frac{\text{Annual profit} \times 100 \times \text{Capital Investment}}{\text{Annual sale} \times 100} = \frac{28855 \times 100}{37400 \times 100} = 25.6\%$$

XVI. Break Even Point Analysis

$$\text{BEP} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{Annual Profit}}$$

Annual fixed cost :

	Rs.
1. Rent	6,000.00
2. Interest	16,845.00
3. Depreciation on Machinery and equipment	3,100.00
4. 40% of Salary	24,480.00
5. 40% of other expenses	600.00
	<u>60,025.00</u>
Say Rs.	<u>60,000.00</u>

$$\text{BEP} = \frac{60000 \times 100}{60000 + 28855} = \frac{6000000}{88855} = 67\% \text{ approx.}$$

XVII. Name & Address of machine suppliers

1. M/s. Maneklal & Sons, 115/116, Narayan Dhuru Street, Bombay-3.
2. M/s. Jayems Machinery, 22, Brabourne Road, Calcutta-1.
3. M/s. Varat Machinery, 28B, Shakespare Sarani, Calcutta-17.
4. M/s. Perfect Machine Tools, 123, Mount Road, Madras-6.

(Reserved item Sl. No. 47)

I. Product & Its Uses

A wooden crate is a container packing used as a container in the transportation of articles which do not require the complete protection as afforded by wooden case.

II. Market Potential

With rapid industrialisation and increased production of consumer and engineering goods, the demand of the packing material is increasing proportionately. Wooden crates are required for transportation of bulks stores by industry & business houses. Demand for crates are sure to increase with rapid industrialisation.

III. Production Target

The scheme envisages to produce wooden crates of assorted sizes of number 500 pcs. per month or 6000 pcs. per annum.

IV. Product Detail & Process of Manufacture

The method of construction of crates are dependent upon the nature of contents to be transported i.e. weight, shape and size.

Planks of required sizes are procured from local market depending on demand. Planks, side beams and battons are cut to size in the cross cutting machine. Top & bottom, sides & ends are separately built up according to sizes of the crates. During assembly for reinforcement purpose wooden square bars may have to given at the 4 corner of the crate with supporting cross bars.

V. Inspection & Quality Control

No critical inspection is necessary for manufacture of crates. However care should be taken to see that no defective raw material is used. Nails and other fixings should be properly secured. Dimensions have to be checked by scales or templates.

VI. Land and Building

Covered area—15 Mt. × 8 Mt.	} Rented
Uncovered area—15 Mt. × 10 Mt.	

VII. Machinery and Equipment

1. 20 vertical band saw with 5 H.P. motor	1 no.	8,000.00
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2. 18 Circular saw with 3 H.P. motor with cross cutting bench	1 no.	5,000.00
3. Hot brazing equipment	1 no.	2,000.00
4. Installation & electrification		1,500.00
5. Furniture & equipment	L.S.	1,000.00
		17,500.00

VIII. Raw Material/Month

1. Mango, Chir or similar packing wood (planks) @20.00/cft.—1200 cft. structure		24,000.00
2. Sal or similar wood for main structure @ 40.00/cft. 300 cft.		12,000.00
3. Nail		1,000.00
		37,000.00

IX. Staff and Labour/Month

Supervisor	1 no. @ 500.00	500.00
Office Asstt.	1 no. @ 350.00	350.00
Skilled Worker	2 nos. @ 350.00	700.00
Mistry	1 no. @ 300.00	300.00
Labour	4 nos. @ 250.00	1,000.00
Watchman	1 no. @ 200.00	200.00
		3,050.00

X. Other Expenses

1. Rent	300.00
2. Electricity	250.00
3. Lubricating & other consumable store	100.00
4. Maintenance	100.00
5. Cartage & freight	500.00
6. Stationery & Postage	100.00
7. Legal charge fees licence	50.00
8. Publicity	100.00
9. Sales & travelling	500.00
10. Other expenses	150.00
	2,150.00

XI. Working Capital/Month

1. Raw material	37,000.00
2. Staff & Labour	3,050.00
3. Other expenses	2,150.00
	42,200.00

XII. Total Capital Investment

	Rs.
1. Machinery & equipment	17,500.00
2. Working capital for 3 months	1,26,600.00
	<u>44,100.00</u>

XIII. Cost of Product/Annum

	Rs.
1. Raw material	4,44,000.00
2. Staff & Labour	36,600.00
3. Other expenses	25,800.00
4. Interest on capital @15%	21,615.00
5. Depreciation on machine 10%	1,750.00
	<u>5,29,765.00</u>
S y Rs.	<u>5,30,000.00</u>

XIV. Total Sale/Annum

	Rs.
(a) By sale of 6000 pcs. crate of assorted size @95.00 (approx.)	5,70,000.00
(b) By sale of scrap (waste wood) L.S.	2,000.00
	<u>5,72,000.00</u>

XV. Profitability (per annum)

Total sale	Cost of production	Profit.
5,72,000.00	5,30,000.00	42,000.00
(a) Percentage of profit on sale —		
$\frac{42,000 \times 100}{5,72,000}$		= 7.3%

(b) Percentage of return over investment

$$\frac{42,000 \times 100}{1,44,100} = 29\%$$

XVI. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{\text{Annual fixed cost} + \text{annual profit.}}$$
$$\frac{50,165 \times 100}{50,165 + 42,000} = 54\%$$

Fixed Cost/annum :

	Rs.
1. Rent	3,600.00
2. Interest	21,615.00
3. Depreciation on m/c. & equipment	1,750.00
4. 40% of salary	14,400.00
5. 40% of other expenses (excluding rent)	8,880.00
	<u>50,165.00</u>

Machinery Suppliers

1. M/s. Atlas Engg. Industries, G. T. Road, Batala (Punjab).
2. M/s. Varat Machinery, 67B, Netaji Subhas Road, Calcutta-1.

(Reserved item Sl. No. 38)

I. Product and its Uses

(a) Wood wool is made of wood in the form of shavings and is used in packaging of fragile articles such as crockeries and other breakable article requiring comparatively cheaper packing materials. This is also used in making wood wool slabs, are widely used for insulation and as accoustic lining in studios.

(b) Market Potential

With the increase of industries requiring this material for packaging purposes both within the country and also for export products, there is a growing demand for this wood based industry. There are several small scale units engaged in the manufacture of this product. However, to meet the growing demand there is still potential market for this item and some more units can come up in the backward areas with locational advantage of forest resources.

II. Production Capacity

Quantity 3-5 tons of wood wool per month of average size 0.25 mm.

Value: Approx. Value of Rs. 3,50,000.

Motive power requirement—30H.P.

III. Production details and process of manufacture

The scheme suggested is based on a imported machine from Czechoslovakia. Other makes of Germany etc., are also available and which have auxiliary attachments to save the material to maximum utilisation of logs upto 15%. Machines made locally are also available, but it is necessary to examine the performance of these machines before the entrepreneurs select the machine.

Process:

(a) Wooden log is cut into pieces about 18 inches long after discarding the portion containing knots.

(b) Cut wooden block is fixed on to the machine table and wood wool is shaved off by the reciprocation action of the table and suitable shaving knife blade mounted on to the columns of the machine.

(c) After drying, the wood wool is pressed in a bailing press and is ready for packing.

Note:—Generally any soft wood is used as the main raw materials, for the manufacture of wood wool. Wood having the grain structure of PINEORDYAR are ideally suited.

As for the quality specifications, wood wool are used under two categories, namely, rough wood and fine shaven wool and accordingly the item can be manufactured with the machine suitably deployed.

IV. Quality Control and Standards

I.S.I. has laid down certain standards and Indian Standard specification No. 1707-1960 is to be followed.

V. Land and Building

(Built up shed rented area
30' x 50' sq. ft.)

Rs. 450.00 p. m.

VI. Machinery and Equipment

Indigenous/
Imported

		Rs.
1. Wood Wool Machine for lengths of stock 420mm and width of stock upto 50mm capacity for producing wood wool of sizes 0.25mm to 0.5mm, Motorised with 16 KW., 1440 rpm, 3 phase, 440 volts, 50 cycles, AC Motor. Suitable Delta Starters and push button switch along with necessary belt and pulleys with standard equipments Model XDV-2h. Czechoslovakia make or similar	(Imported) one	1,75,000.00
2. Vertical band saw 36" wheel dia motorised with 7.5 HP motor	one	11,000.00
3. Bailing Press size 2½ ft. area INDODYOG or similar	one	8,000.00
4. Pedestal Grinder Wheel dia 6"	one	1,300.00
5. Furniture & Office equipments (Lumpsum)		5,000.00
6. Electrification & Installation		5,000.00
		<u>2,05,300.00</u>

VII. Raw Materials (per month)

1. Soft wood logs, Blue Pine, Silver pine and similar soft wood approx. 14 Tons @ Rs. 1000 per ton.	Rs. 14,000.00
Bailing Hoops etc.	300.00
	<u>14,300.00</u>

VIII. Staff and Labour (per month)

(1) <i>Personnel (Administrative)</i> :	Rs.
1. Manager one	600.00
2. Store-keeper-cum-Typist . . . one	350.00
	<u>950.00</u>

(2) Technical (Skilled/Unskilled) :

	Rs.
1. Setter-cum-machine operator . . one	500.00
2. Unskilled Workers Three	600.00
3. Watchman Two	200.00
4. Sweeper one	100.00
	<u>1,400.00</u>

IX. Other Contingent Expenses (per month)

	Rs.
Power & Water	400.00
Rent	450.00
Postage & Stationery	200.00
Telephone	150.00
Consumable Stores	150.00
Repairs & Maintenance	200.00
Transport Charges	300.00
Advertisement & Publicity	150.00
Insurance	200.00
Taxes	200.00
Sales Expenses	200.00
Miscl. expenses	150.00
	<u>2,750.00</u>

X. Total Recurring Expenses (per month)	Rs. 16,700.00
Total Working Capital (On 3 months basis)	50,100.00

XI. Total Capital Investment

	Rs.
(i) Fixed Capital	2,05,300.00
(ii) Working Capital	50,100.00
	<u>2,55,400.00</u>

XII. Cost of Production (per year)

	Rs.
Total recurring cost per year	2,24,400.00
Depreciation on Machinery & Equipments @ 10%	20,000.00
Interest on total investment @ 15%	38,310.00
Total cost of production	<u>2,82,710.00</u>

XIII. Sales Proceeds (per year)

	Rs.
Return from sale of wood wool of average size of 0.25 mm	3,50,000.00

XIV. Profitability

Profit per year (Before taxes)	67,290.00
Percentage Profit over sales Profit per year $\times 100$	
$= \frac{67,290}{3,50,000} \times 100$	$= 19.2\%$
Percentage Profit of return Net profit per year $\times 100$	
$= \frac{67,290}{2,55,400} \times 100$	$= 26.3\%$

XV. Break-Even Analysis**(1) Fixed Cost :**

	Rs.
(a) Depreciation (on machinery & equipment tools, Fixtures & other Office equipment)	20,000.00
(b) Rent	5,400.00
(c) Interest on total investment	38,310.00
(d) Insurance	2,400.00
(e) 40% Salary & Wages	940.00
	<u>67,050.00</u>
(f) 40% of other contingent expenses (excluding rent & Insurance)	23,400.00
Total Fixed Cost	<u>90,450.00</u>

$$\begin{aligned} \text{B.E.P. \%} &= \frac{\text{FC} \times 100}{\text{FC} + \text{P}} \\ &= \frac{90,450 \times 100}{90,450 + 67,290} \\ &= \frac{90,450 \times 100}{1,57,740} \\ &= \frac{904500}{15774} \\ &= 53.92\% \end{aligned}$$

XVI. Additional Information :

The product is a wood based industry and it will be advantageous to locate nearer to forest areas. The industry does not involve very high skill and quality control.

XVII. Addresses of Machinery & Equipment Suppliers

1. M/s. Khemka & Co. (Agencies) Pvt. Ltd., Tosh House, 31/32, India Exchange, Calcutta-1.
2. M/s. Betliboi & Co., Parliament St., New Delhi.
3. M/s. Machines Industries, Calcutta-9.
4. M/s. C. A. Willner & Co., No. 15, Richmond Road, Bangalore.
5. National Small Industries Corporation, Okhla, New Delhi.
6. M/s. Poovathinkgal Engg. Co., Kuriachira, Trichur (Kerala).

(Reserved item Sl. No. 50)

I. Product & its Uses

It is a circular disc made of high carbon steel having teeth on the periphery and bore in the centre. It is mounted on a shaft and runs at a high speed to cut the wood. It is low cost device to cut the timber than band saws. It is used to cut the timber pieces from the timber already cut on the band saws and cannot be used for logs.

This is mostly used by packing case manufacturers for cutting the planks to size for making the cases. Due to the expanding industrial activity, there is good demand for packing cases and hence the potential for circular saws.

II. Production target

The project envisages the manufacture of 750 pcs. of saws per month.

III. Production details and process of manufacture

Product is made from High carbon steel sheets. First it is cut into square pieces then corners are pruned on the sheet cutler. Then these pieces are drilled and bored on the lathe. Further, these are put on a mandrel (25 to 30 pcs. per set) and turned to accurate size. Then the teeth are cut on the milling machine. Pieces are then sent for heat-treatment. Bore is internally ground while the both faces are surface ground.

Finally teeth are sharpened to make them suitable for cutting.

Note:—If pre-heat-treated (hardened and tempered) steel is available then there is no need of carrying out heat-treatment operations.

IV. Inspection & quality control

ISI specifications are not available on the item. The details requiring attention from quality angle are the correct chemical composition of the material i.e. carbon content, the proper hardness and the size of the bore. No provision has been made in the project for checking the chemical composition as it can be got done from outside laboratory when the material is being purchased. Provision has been made for precision measuring

instruments for checking the sizes and a hardness testing machine: IS 5031-1961 on Metal Slitting Saws can be made use of as a reference to know the type of tests and quality control systems.

V. Land and Building

1. 17×7 metres shed	} Mandrel	Rs.
2. 4×4 metres office		750-00

VI. Machinery and Equipments

		Rs.
1. Sheet Cutler Lever type 37mm suitable to cut 3 mm thick sheets	1	1,000-00
2. Lathe 800 mm bed, special purpose complete with 2 HP Electric Motors and starters, etc.	1	8,000-00
3. Milling Machine Universal No. 2 complete with 2 H.P. Electric motor and starter, etc.	1	23,000-00
4. Lathe 1800 mm with internal grinding attachment—complete with Electric Motors 3 H.P. and starter	1	13,000-00
5. Lathe 1800 mm with magnetic chuck and grinding attachment for grinding the faces complete with 3 H.P. electric motors and starter	1	13,000-00
6. Special purpose Tool & Cutter Grinder, complete with 1 HP electric motor and starter	1	8,000-00
7. Stamping Machine	1	2,000-00
8. Hardness testing machine	1	8,000-00
9. Bench grinder double ended 10" wheel cap.	1	1,500-00
10. Erection and installation charges @ 10%		7,000-00
11. Workshop tools, precision measuring tools, etc.		3,000-00
12. Office furniture & equipment		2,500-00
		91,000-00

VII. Raw Material required (per month)

High Carbon Steel Sheets 2.25 tonnes for 750 Saws at average weight of 3 Kg. per pc. @ Rs. 5,000/- per tonne	11,250-00
--	-----------

VIII. Staff and Labour (per month):

		Rs.
1. Accountant-cum-Clerk	1	400-00
2. Peon-cum-Chowkidar	1	200-00
3. Part-time Sweeper	1	50-00
4. Foreman	1	600-00
5. Skilled Workers	5	1,500-00
6. Semi-skilled worker	1	250-00
7. Packing Man	1	200-00
		3,300-00

IX. Other Expenses (per month)

	Rs.
1. Electricity & water expenses	300.00
2. Heat-treatment charges	2,200.00
3. Rent	750.00
4. Consumables, oil, lubricants, tools, etc.	300.00
5. Grindings Wheels	600.00
6. Postage & stationery	100.00
7. Travelling Expenses	200.00
8. Cartage	50.00
9. Publicity & other expenses	200.00
10. Misc.	400.00
Total	5,100.00

X. Working Capital required (per month)

1. Raw Materials	11,250.00
2. Staff & Labour	3,200.00
3. Other Expenses	5,100.00
Say :	19,550.00
	19,600.00

XI. Total Capital investment

1. Machinery & Equipments	91,000.00
2. Working capital for three months.	58,800.00
	1,49,800.00

XII. Cost of Production (per annum)

1. Recurring expenses : Rs. 19,000 × 12	2,35,200.00
2. Interest on capital @ 15% per annum	22,500.00
3. Depreciation on machinery and equipments @ 10%	9,100.00
4. Sales expenses @ Rs. 2,000/- p.m.	24,000.00
	2,90,800.00
Say	2,91,000.00

XIII. Sales Proceeds (per annum)

By Sale of 8,640 pcs. of cutters (allowing 4% rejections) @ Rs. 42/-	3,62,880.00
Say	3,63,000.00

XIV. Profitability

Profit :	Total Sales	cost of production
Rs. 3,63,000	— 2,91,000	— 72,000/-
(a) Percentage of profit on sales		
$\frac{72,000 \times 100}{3,63,000}$		= 20%
(b) Percentage of return on investment		
$\frac{72,000 \times 100}{1,50,000}$		= 48%

XV. Break Even Analysis

$$\text{B.E.P.} = \frac{\text{Annual Fixed cost} \times 100}{\text{Annual fixed cost} + \text{profit}}$$

Annual Fixed cost :

	Rs.
1. Rent	9,000.00
2. Interest	22,500.00
3. Depreciation	9,100.00
4. 40% of salaries	15,360.00
5. 40% of other expenses	25,680.00
Say :	81,640.00
	82,000.00

$$\text{B.E.P.} = \frac{82,000 \times 100}{82,000 + 72,000}$$

$$= \frac{82,000 \times 100}{1,54,000}$$

$$= 53\%$$

XVI. Addresses of machinery suppliers

1. M/s. Dee Jay Mech. Works, Partap Chowk, Industrial Area 'B', Ludhiana.
2. M/s. Batliboi & Co., (P) Ltd., 190-A, Fortess Street, Bombay.
3. M/s. New United Machine Tools, G.T. Road, Miller Ganj, Ludhiana.
4. M/s. Bhambar Machine Tools, Janta Nagar, Industrial Area 'B', Ludhiana.
5. M/s. Kalsi Machinery Works, G. T. Road, Miller Ganj, Ludhiana.
6. M/s. Perfect Machine Tools Co. (P) Ltd., Bell Building, Sir P. M. Road, Bombay-400001.
7. M/s. Power Tools and Appliances Co. 2-B.B.D. Bagh, Calcutta-700001.
8. M/s. Accurate Engineering Ltd., No. 67, Hadapson Industrial Estate, P. B. No. 1202, Poona-13.
9. M/s. Rajeshwari Industrial & Sales Co., Wilson Street, Market Canding, Kottayama, Kerala.
10. M/ . Cimotec, No. 44-B, Seshadripuram, Main Road, Bangalore-20.

(Res rved it m Sl. No. 416)

I. Product and its Uses

(a) Wrenches are finding place in every house in the developed countries apart from industries and repair workshops. This profile deals with the manufacture of pipe wrenches, which have indispensable use in repair of pipe lines.

(b) Production Targets

It is proposed to make 300 wrenches per day or 90,000 wrenches per annum.

(c) Market Potential

Pipe wrenches have got tremendous market potential in Western as well as developing countries. These being labour intensive items, Indian Small Industries are advantageously placed to produce more economically.

(d) Indian Standards

I.S.I. has specified I.S. No. 4003-1967 for pipe wrenches.

(e) Inspection & Quality Control

I.S.I. Specification should be followed.

II. Production details and process of manufacture

The steel used for the manufacture of pipe wrenches is constructional steel C-40. The main work involved in the manufacture of pipe wrenches is forging and machining.

The Main body and the sliding jaw undergo the process of heating forging machining and heat treatment and are painted thereafter. The knurled Nut is produced by turning drilling & boring and then by knurling & threading operations.

III. Land and Building

Total area of about 1500 sq. meters is required for the project out of which about Rs. 2,75,000/- 800 sq meters will be covered and the rest will be open.

IV. Machinery and Equipments**(a) Production Machines:**

1. Drop forging Hammer 1 Ton cap.	1 No.	Rs. 1,80,000.00
2. Heating furnace oil fired with temperature control	1 No.	20,000.00

		Rs.
3. Power Press-200 Tons Cap.	1 No.	50,000.00
4. Milling Machines No. 2 (Horizontal)	2 Nos.	40,000.00
5. Production Lathe—4 ft. size	8 Nos.	32,000.00
6. Screw Cutting Lathes 4 ft. size with 150 mm C. Ht.	4 Nos.	20,000.00
7. Bench Drilling Machines 1/2" Cap.	2 Nos.	4,000.00
8. Heat Treatment Furnace Oil Fired	1 No.	12,000.00
9. Pedestal Grinders 12" wheel dia.	2 Nos.	8,000.00
10. Die Blocks	4 Sets	15,000.00
11. Spray Painting equipment i.e. Air Compressor, Spray Guns etc.	—	5,000.00
		3,86,000.00

(b) Testing equipment :

1. Hardness Testing Machine (for Rockwell)	1 No.	5,000.00
2. Deflection Testing Machine	1 No.	4,000.00
3. Measuring instruments and gauges	1 Set	5,000.00
		14,000.00

(c) Maintenance Machinery and Tool Room :

1. Tool Room Lathe 6'x10" Centre Height	1 No.	20,000.00
2. Shaper—24" stroke	1 No.	15,000.00
3. Vertical Milling Machine	1 No.	20,000.00
4. Pillar Drilling Machine 1 1/2" cap	1 No.	5,000.00
5. Die grinding Kit	1 No.	5,000.00
6. Tool & Cutter grinder (small)	1 No.	10,000.00
		75,000.00

(d) Office equipment :

1. Furniture		3,000.00
2. Typewriter		2,000.00
3. Fans & Fixtures		1,000.00
4. Scooter		5,000.00
		11,000.00

Installation charges 40,000.00

Total of (a), (b), (c), (d) & (e) above Rs. 5,26,000.00

V. Raw Materials (per month)

	Rs.
1. Mild steel carbon steel 0.45% carbon 9.5 Tonnes @ Rs. 3,000/- per tonne	28,500.00
2. Malleable frames to be purchased from outside 7500 Nos.	9,400.00
3. Rivet & springs (bought out)	2,500.00
4. Material for mat M. S. 1.5 Tonnes @ Rs. 2,200.00 per Tonne	3,300.00
	<u>43,700.00</u>

VI. Staff and Labour

1. Manager	1	1,000.00
2. Supervisors	2	1,000.00
3. Skilled/Semi-skilled Workers	20	6,000.00
4. Helpers	8	1,600.00
5. Accommodation Clerk	1	400.00
6. Chowkidar	1	200.00
7. Peon	1	200.00
8. Part-time Sweeper	2	500.00
		<u>10,450.00</u>

VII. Other Expenses

1. Electricity and Water (75 H.P.)	1,200.00
2. Furnace Oil 3,000 Litres	4,800.00
3. Lubricants & Coolants	1,500.00
4. Transport/Cartage	800.00
5. Packaging	1,500.00
6. Paints	3,000.00
7. Tools, cutters, wheels, cotton waste etc.	4,000.00
8. Travelling expenses	1,000.00
9. Miscellaneous	1,500.00
10. Printing, Postage & Stationery	500.00
11. Telephone charges	400.00
Total	19,500.00

VIII. Working Capital (for 3 months)

1. Raw Materials	1,31,100.00
2. Salaries of staff and labour	31,350.00
3. Other expenses	58,500.00
	<u>2,20,950.00</u>
Say	<u>2,21,000.00</u>

IX. Total Capital

	Rs.
1. Land and Building	2,75,000.00
2. Machinery & Equipment	5,26,000.00
3. Working Capital	2,21,000.00
Total	<u>10,22,000.00</u>

X. Cost of Production (per annum)

	Rs.
1. Raw Materials	3,14,000.00
2. Salaries & Wages	1,25,000.00
3. Other Expenses	2,34,000.00
4. Interest on total capital @ 15% per annum	1,51,150.00
5. Depreciation on machinery @ 10% per annum	48,600.00
6. Depreciation on building @ 5% per annum	12,600.00
7. Sales Expenses @ 5%	54,000.00
	<u>11,51,550.00</u>
Say	<u>11,52,000.00</u>

XI. Sales Proceeds

	Rs.
1. By sale of 90,000 Wrenches @ Rs. 15/- each	13,50,000.00
2. By sale of 12 Tonnes of scrap @ Rs. 800/- per Tonne	9,600.00
	<u>13,59,600.00</u>
Say	<u>13,60,000.00</u>

XII. Profitability

Sale minus cost of Production = Profit.

Or 13,60,000.00 — 11,52,000.00 = 2,07,000.00

Percentage of profit over sales = $\frac{2,07,000 \times 100}{13,60,000} = 15\%$

XIII. Break Even Analysis

$$\begin{aligned} \text{B.E.P.} &= \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Sales} - \text{Annual Variable Cost}} \\ &= \frac{13,60,000 - 8,93,000}{2,59,000 \times 100} \\ &= \frac{4,67,000}{2,59,000 \times 100} = 55\% \end{aligned}$$

XIV. Names and Addresses of Machinery Suppliers

1. M/s. Narayan Singh Katar Singh (Regd.) Industrial Area "A" Ludhiana.	Drop Forging Hammers & Furnace
2. M/s. Burren Mechanical Works, Industrial Area "A" Ludhiana.	Power Presses.
3. M/s. B. Indian Engineers, Ind. Area "B", Ludhiana.	Milling Machine.
4. M/s. Globe Automobiles, Industrial Area, G.T. Road, Millerganj, Ludhiana.	Production Lathes & Threading Lathes.
5. M/s. Butiboi & Company, G.T. Road, Millerganj, Ludhiana.	Tool Room Lathes, Pedestal and Bench Grinders, Bench Drilling Machine, Hardness Tester etc.
6. M/s. New Standard Engineering Co. Limited, Carroi Road, Bombay-18.	Drop Hammers.
7. M/s. Prem Engineering Works, 32, Okhla Industrial Estate, New Delhi-20.	Power Presses.

(Reserved item Sl. No. 417)

I. Product and its Uses

(a) Zip fasteners is a product used for interlocking two parts of any product made from cotton, leather or rexin cloth. These are manufactured in different strength and different sizes.

(b) Market Potential

Due to low cost and easy operation, these days, zip fasteners are used by every common man. There are numerous products which are fitted with zip fasteners. Hence, it has good market.

This item is reserved for small scale industry. There is good scope to cater to increasing demand not only in indigenous market but also export demand.

II. Production Target

Although zip fasteners are manufactured in various sizes but the economics in the scheme is based on 6" size brass zip fasteners having production capacity of 1,62,500 pieces, per month.

III. Production Details and Process of Manufacture

Keeping in view that sliders are available from market, it is proposed to purchase sliders from outside. Following sequence of operations are performed:—

1. Stitching bead in to tape.
2. Fixing teeth on the tape (Stringer).
3. Joining two half of the stringer.
4. Attaching of bottom step.
5. Rolling and brushing of stringer.
6. Mangling and waxing of stringer.
7. Attaching of slider.
8. Attaching of top stops.
9. Final cutting.
10. Testing and inspection.

IV. Inspection and Quality Control

Raw material control and production process control is done as per Indian Standard Specification. Following specification is available—

IS—3148—1967—Specification for Metallic slide fasteners.

V. Land and Building

Covered area, 100 sq. metre—	Rs.
Rented	500-00

VI. Machinery and Equipment

1. Zip Chain making machine	2 Nos.	
2. Tape & Cord sewing machine.	2 Nos.	
3. Rolling and brushing machine.	1 No.	
4. Mangling and Waxing machine	1 No.	50,000-00
5. Bottom stop machine	1 No.	
6. Top stop machine	1 No.	
7. Joining fixture	1 No.	
8. Installation and electrification.		5,000-00
		<u>55,000-00</u>

VII. Raw Material Requirements (per month)

1. Textile tape Woven fabric with a selvedge in the inner edge 1 1/2" wide 60,000 metres @ Rs. 17/- per 100 metres	10,200-00
2. Bead, 120,000 metres @ Rs. 2/- per 100 metres	2,400-00
3. Sewing thread 250,000 metres @ Rs. 32/- per 10,000 metres	800-00
4. Brass strip size 0-032" thick x 0-125" width 828 Kgs. @ Rs. 35/- per Kg.	28,980-00
5. Brass strip size 0-016" x 0-125", 7-5 Kgs. @ Rs. 35/- per Kg.	262-50
6. Sliders 162,500 Nos. @ Rs. 8/- per 100 pcs.	13,000-00
	<u>55,642-50</u>
	56,000-00

Say

VIII. Staff and Labour (per month)

1. Manager	1 No.	800-00
2. Typist cum Clerk	1 No.	350-00
3. Skilled worker	1 No.	400-00
4. Semi-skilled Workers	6 Nos. @250/-	1,500-00
5. Unskilled workers	5 Nos. @Rs. 200/-	1,000-00
6. Watchman	1 No.	200-00
7. Peon	1 No.	200-00
8. Cost of labour benefit		650-00
		<u>5,100-00</u>

IX. Other Expenses (per month)

	Rs.
1. Rent	500.00
2. Electricity and water	200.00
3. Consumable and dies, etc.	1,000.00
4. Freight, etc.	100.00
5. Publicity	100.00
6. Postage and stationery	100.00
	<u>2,000.00</u>

X. Working Capital (per month)

1. Raw material	56,000.00
2. Staff and labour	5,100.00
8. Other expenses	2,000.00
	<u>63,100.00</u>
Say	63,000.00

XI. Total Capital Investment

1. Machinery and Equipments	55,000.00
2. Working capital for 3 months	1,89,000.00
	<u>2,44,000.00</u>

XII. Cost of Production (per annum)

1. Raw material	6,72,000.00
2. Staff and labour	61,200.00
3. Other expenses	24,000.00
4. Interest on capital @ 15%	36,600.00
5. Depreciation on machinery 10%	5,500.00
	<u>7,99,300.00</u>

XIII. Total Sale (per annum)

1. By sale of 19,50,000 pcs. of 6" size zip fasteners @ Rs. 43/- per 100 pcs.	8,38,500.00
2. By sale of brass scrap, etc.	18,000.00
	<u>8,56,500.00</u>

XIV. Profitability (per annum)

Total sale — Cost of Production = Profit	
Rs. 8,56,500.00 — Rs. 7,99,300.00 = Rs. 57,200.00	
(a) Percentage of profit on sale = $\frac{57200 \times 100}{856500}$	= 7%
(b) Percentage of profit over investment = $\frac{57200 \times 100}{244000}$	= 23.5%

XV. Break even Analysis

$$\text{B.E.P.} = \frac{\text{Annual fixed cost} \times 100}{(\text{Annual cost} + \text{Profit})}$$

Fixed cost (per annum)

1. Rent	6,000.00
2. Interest	36,600.00
3. Depreciation on machinery	5,500.00
4. 40% of Salaries	24,500.00
5. 40% of other expenses	7,200.00
	<u>79,800.00</u>

$$\text{B.E.P.} = \frac{79800 \times 100}{(79800 - 57200)} = 58\%$$

XVI. Machinery Suppliers

Dr. Karl F. Nagele GmbH & Co.
Osumstr 1-15, 7000 Stuttgart 72
Hohenheim, (W. Germany).

(Reserved item] Sl. No. 387)

CHEMICAL AND ALLIED INDUSTRIES

I. Introduction

The most important ingredients of varnishes are resins. Different types of resins are used in manufacture of varnishes. Originally all the varnishes were used to be prepared from the resins of natural origin. The production of varnishes from natural resins suffers some disadvantages, inevitable with so many natural products. Besides, many impurities are also present in natural resins which render the quality of varnishes inferior. Synthetic resins have provided a valuable alternative which revolutionised the paint and plywood industry. The demand for synthetic resins today is quite high and increasing rapidly. The scheme aim at the production of one of the most important resins namely Alkyd Resin of all types—long, medium and short.

II. Technical Aspects

(a) Process Outlines:

Main raw materials are as under:—

1. Linseed and other drying and semi-drying oils.
2. Phthalic anhydride.
3. Pentaerythritol.

All these raw materials are indigenously available.

Process of Manufacture

The oil is first heated at appropriate temperature (usually of the order of 240°C) with necessary quantity of polyhydric alcohol preferably penta erythritol under reflux. The fatty acids in the oil are redistributed over alcohol. The resulting material is generally called as "monoglyceride". Esterification of this "monoglyceride" is done by adding the phthalic anhydride and continuing the cooking at temperature normally in the range of 220—260°C. As the temperature is raised, water from the esterification reaction is evolved and the viscosity of resin increases simultaneously. Vacuum may be applied if required to increase the rate of reaction by efficiently removing the water. The resulting resin is cooled and discharged for packing. Pale coloured alkyd resin is reduced using carbon-di-oxide for making inert atmosphere.

(b) Quality Specification

Short, medium and long types as per requirement of consumers.

(c) Production Capacity (per annum) :

- (i) Quantity—300 m.t.
- (ii) Value—Rs. 39,00,000/-

III. Financial Aspects

(a) Fixed Capital

(a) Land and Building :

	Rs.
Land— 1,500 sq. ft. @ Rs. 15/- per sq. ft	22,500-00
Shed—1,000 sq. ft. divided into office, laboratory, works, boiler room, stores etc.	45,000-00
Total	67,500-00

(b) Machinery and Equipment :

Sl. No.	Description	No.	Rate Rs.	Prices Rs.
1.	Resin Kettle made of stainless Steel with Condenser, Jacket (m. s.) Agitator driven by motor (7.5 HP) with reduction gear, drain Roller, Sample outlet dial thermometer and other accessories. Cap. 2,000 litre	1	1,20,000-00	1,20,000-00
2.	Vacuum Pump 800 Litre/minute air displacement complete with 5 H.P. motor etc.	1	7,000-00	7,000-00
3.	Oil fired furnace with three burners	1	20,000-00	20,000-00
4.	Baby boiler 200 rating 100 psi with motor, water tanks steam outlet etc.	1	20,000-00	20,000-00
5.	M. S. Storage tank for linseed oil cap. 20 M.T.	1	25,000-00	25,000-00
6.	M. S. Storage tank for Alkyd resin 5 M.T. cap.	1	8,000-00	8,000-00
7.	Water arrangement with over head pump pipe fittings etc.	1 set	10,000-00	10,000-00
8.	Fire extinguishers	4	500-00	2,000-00
9.	Hydraulic trolley	1	8,000-00	8,000-00
10.	Laboratory equipment and chemical etc.	L.S.		10,000-00
11.	Miscellaneous tools & fittings	L.S.		2,000-00
				2,32,000-00
Total				2,32,000-00

Installation & Electrification Charge 15%	Rs. 35,000.00
Total cost of machinery & equipment	2,67,000.00
Total Fixed Capital=Land & building+Machinery & Equipment	=67,500+2,67,00 =Rs. 3,34,500.00

(B) Working Capital (per Month)

(i) Personnel :

Designation	No.	Salary Total (Rs.)
Administrative & Supervisory :		
General Manager	1	1,500.00
Production Manager	1	1,000.00
Sales Organiser	1	800.00
Accountant-cum-Clerk	1	600.00
Peon	1	200.00
Darwan	1	250.00
		4,350.00
Technical—Skilled & unskilled :		
Manufacturing Chemist	1	1,000.00
Analytical Chemist	1	750.00
Skilled Worker	6	1,800.00
Unskilled Worker	6	1,200.00
Peon	1	200.00
Darwan	2	500.00
		5,450.00
Total		9,800.00
Add Perquisites @ 15% on Salary		1,500.00
		11,300.00

(ii) Raw Materials (including Packaging Requirements) :

Particulars	Indi- genous/ Imported	Qty.	Rate Rs.	Value Rs.
Linseed Oil	Indi- genous	13 MT	6,000.00	78,000.00
Pathalic Anhydride	„	57 MT	12,000.00	6,84,000.00
Pentaerythritol	„	3 MT	20,000.00	60,000.00
Catalyst & Others	„	L.S.		5,000.00
200 litre Barrels		125 Nos.	100.00	12,500.00
				2,23,900.00

(iii) Utilities (per month) :

1. Power 2500 KWH unit @ 30/unit	750.00
2. Fuel (coal plus furnace oil) L.S.	3,000.00
3. Water	500.00
	4,250.00

(iv) Other Contingent Expenses (per month) :

	Rs.
Postage & Stationery	500.00
Telephone	500.00
Repairs and Maintenance	1,000.00
Transport and Conveyance	1,000.00
Advertisement and Publicity	1,000.00
Consumable Stores	500.00
Laboratory Chemicals	500.00
	5,000.00

Total Working Capital for one month :
(i) + (ii) + (iii) + (iv) = Rs. 2,44,450.00

IV. Total Capital Investment :

Fixed Capital	3,34,500.00
Working Capital (on 3 months basis)	7,33,350.00
Total	10,67,850.00
or Say	10,68,000.00

V. Cost of Production (per year)

Total Recurring Exp. per year	29,33,400.00
Depreciation on Machinery & Equipment @ 10% p.a.	26,700.00
Depreciation on Building @ 15% p.a.	2,250.00
Interest on Capital Investment @ 15%	1,61,250.00
Sales Commission @ 10% on sales	3,90,000.00
	35,13,550.00

VI. Turn over per year

Alkyd Resins 300 M.T. @Rs. 13,000/- per M.T. 39,00,000.00

VII. Net Profit

Rs. 39,00,000 — Rs. 35,13,550 = Rs. 3,86,450.00

VIII. Rate of Return

36.7%

IX. Break Even Point

45%

X. Suppliers of Raw Materials

1. M/s. Durgapur Chemicals Ltd.,
6-A, Little Russel St.,
Calcutta-16.
2. M/s. Atul Drug House,
Bombay.
3. M/s. Allied Resins & Chemicals,
13, Camae Street, Calcutta-16.
4. Herdillia Chemicals Ltd.,
Thana, Bombay.

XI. Suppliers of Machinery and Equipment

1. The United Engineers,
61, Simla Road, Calcutta-6.
2. Ms. Millard & Col.
B. L. Shah Road, Calcutta-53.
3. Anup Engineering Works,
Ahmedabad.
4. Gansons (Pvt.) Limited,
Delhi, Bombay, Calcutta.
5. Glasgow Engineers,
B. L. Shah Road,
Calcutta.
6. A.P.V. Engineers,
Jessore Road, Calcutta-28.

(Reserved item Sl. No. 252).

I. Introduction

Chemically Azo dyes are the dyes, which are manufactured on a general principle of dissolving any aromatic primary amine followed by diazotization and coupling with any compound containing a hydroxyl group. Azo dyes are one of the most important dyes developed long ago. Although there has been appreciable development in the field, there is scope for creation of new units.

Raw materials required for the manufacture of this dye are Benzidine hydro chloride, hydrochloric acid, Sodium nitrite, Sodium Naphthionate Sodium Acetate and Sodium carbonate. Out of these most of the raw materials are indigenously available without much difficulty. Benzidine hydrochloride and soda ash are at times become scarce.

All the machineries can easily be fabricated from the local fabricators manufacturing chemical plants. While selecting site for the industry availability of water, power, transport and other infrastructural facilities must be taken into consideration.

II. Technical Aspects**(a) Process Outlines**

Benzidine hydrochloride is first dissolved in cold water in wooden vat, to which cold sodium nitrite solution is added slowly with constant stirring and cooling with stirring.

(b) Quality specifications

Indian Standard Institution has laid down a specification for general testing of Azo dyes vide their specification No. IS : 19 (Part I). Individual dyes may, however be tested as per BSS or ASTM standard.

(c) Production capacity (per annum)

Quantity—75 M.T.

Value—Rs. 41,25,000.00

III. Financial Aspects**A. Fixed capital****Land and Building**

- (i) Land—250 sq. m.
Building & shed—150 sq. metres—Rs. 40,000.00

(ii) Plant and Machinery (all indigenous)

Description	No.	Value (Rs.)
1. Reaction vessel with mechanical stirrer and cooling coils wooden Cap. 100 L each	7 nos.	35,000.00
2. Wooden and other M. S. tanks cap. 150 ltr. each	4 nos.	20,000.00
3. Wooden filter press (coke washing type) with all accessories	1 no.	20,000.00
4. Drying chamber M.S. with 4 aluminium trays, steam heating arrangement etc.	1 no.	20,000.00
5. Baby boiler 50 kg/hr 100 Psi with motor pump, pipe fittings chimney, etc. coal fired type	1 no.	15,000.00
6. Tube well, pump, overhead tanks etc.	L.S.	10,000.00
7. Testing laboratory		8,000.00
8. Misc. equipment & tools		5,000.00
9. Office furniture, typewriter etc.		7,000.00
		1,40,000.00
10. Fire extinguishers, first aid box, weighing side etc.		5,000.00
		1,45,000.00
Installation and Electrification charges @ 15%		21,000.00
		1,66,000.00

Total fixed capital=i+ii (above)

Rs 40,000.00+1,66,000.00=Rs. 2,06,000.00

2. Working capital (per month)**(i) Raw material (per month)**

Item	Qty.	Rate (Rs./kg.)	Value Rs.
1. Benzidine Dihydrochloride	2100 Kg.	55.00	1,15,500.00
2. Hydrochloric acid	2400 Kg.	0.60	1,440.00
3. Sodium nitrite	1000 Kg.	6.00	6,000.00
4. Sodium Napytheonate	5000 Kg.	18.00	90,000.00
5. Sodium Acetate	1000 Kg.	4.00	4,000.00
6. Sodium carbonate	1700 Kg.	3.00	5,100.00
7. Packing materials MS drum, polythene bag (50 kg. each)	125 nos.	80.00	10,000.00
			2,32,040.00
Say			2,32,000.00

(ii) Utilities (per month)

	Rs.
Electricity 2000 KWH @ 0.40 per unit	800.00
Coal—2 MT @ Rs. 200/-	400.00
Water LS	200.00
	1,400.00

(iii) Personnel

Administrative and Office

	No.	Rs.
General Manager	1	1,500·00
Production Manager	1	1,200·00
Manufacturing Chemist	1	1,000·00
Analyst	1	700·00
Accountant/clerk	1	500·00
Peon	1	200·00
Darwan	1	250·00
		5,350·00

Technical

Skilled workers	4	1,600·00
Unskilled workers	6	1,500·00
Peon	1	200·00
Darwan/watchman	2	500·00
		3,800·00

Total salaries/wages		9,150·00
Perquisites @ 20%		1,850·00
		11,000·00

(iv) Other contingencies

	Rs.
Repair/maintenance	500·00
Transport/conveyance	1,000·00
Advertisement/publicity	1,000·00
Postage/Stationery	500·00
Consumable tools	300·00
Misc.	200·00
	3,500·00

(v) Total working capital (per month)

$I + II + III + IV + \text{(above)}$
= Rs. 2,3,200·00 + 1,400·00 + 11,000·00 + 3,500·00
= Rs. 2,47,900·00

(vi) Working capital for 3 months = Rs. 7,42,800·00

3. Total capital Investment

$Rs. 2,06,000 + Rs. 7,42,800·00 = Rs. 9,48,800·00$
(Say : Rs. 9,49,000·00)

D. Total cost of production per year

	Rs.
Recurring expenditure	29,71,200·00
Interest on capital @ 15%	1,42,350·00
Depreciation on machinery @ 10%	16,000·00
Depreciation on office furniture etc.	400·00
Depreciation on shed @ 5%	1,500·00
	31,31,450·00
Say	31,31,500·00

(E) Turnover per year

	Rs.
7·5 MT Congo red @ Rs. 55/- per kg.	41,000·00
Less sales commission @ 10%	4,12,500·00
	37,12,500·00

(F) Profit per annum (before taxation)	5,81,000·00
(G) Percentage of profit on total investment	55%
(H) Break-even point	34%

Suppliers of Raw materials

1. M/s. Amar Dye Chem., Bombay.
2. M/s. Garda Chemicals, Bombay.
3. M/s. Tata Chemicals, Mithapur Gujarat.
4. M/s. Deepak Nitrite Pvt. Ltd., Bombay.

Suppliers of Machinery and Equipment

1. M/s. Bhaskar Engineers, Biren Roy Road, Behala.
2. M/s. Gallys' Engineering Works, Belebons Road, Salkia, Howrah.
3. M/s. The United Engineers, 61, Simla Road, Calcutta-6.
4. M/s. Sethi Engineering Works, 2777, Z-Singh Marg, Delhi.
5. M/s. K. S. Seetharamaiah & Sons, 29/1 Jaragaenahalli 6th Mile, Kanak Pura Road, Bangalore.

(Reserved item Sl. No. 213).

BITUMINISED WATER PROOF PAPER

I. Introduction

Bituminised laminated materials like tray paper, jute, cotton fabric etc. are presently being used extensively for packing of both industrial as well as consumer products. The lamination of paper with cloth, jute, polyethylene etc. with bitumen as binding material provide added advantages like protection against damp micro-organism insects and pests etc. The lamination also helps in making it more suitable for packing fine powdery materials and preventing the odour transmission to the atmosphere.

Bituminised water proof paper is being used for packing ready-made garments chemicals, minerals, pesticides, handicrafts, textiles, plastic raw materials etc. for domestic or export markets.

II. Technical Aspects

(a) *Process Outline* : Paper rolls are mounted on the stand and adjusted for side play and tension. These are then passed through bitumen application roller. The thickness of coating is adjusted through the device fitted on the machine. These are cooled on chilling rolls and are delivered through delivery rolls for final slitting and unwinding.

(b) *Quality Specification* : As per customers requirements IS. 5134-1969.

(iii) Production capacity (per annum for single shift works) :

- (i) Quantity : 120 MT
- (ii) Value : Rs. 9,00,000/-
- (iv) Motive Power : 10HP.

III. Financial Aspects

(i) Land and Building

Land	500 sq. metres	Rs.
Building area— office, stores etc.	50 sq. metres	
working shed	150 sq. metres	
	Rented 2000/- per. m.	

Machinery & Equipment

(a) Production Unit

1. Bitumen Lamination plant size 48" complete with motors, reduction gear, variables speed control Bitumen, melting tank etc. suitable for bonding two layers or the bitumen lining 1 1,00,000-00
2. Heavy duty Gross sheet cutter (paper shearing machine) 1 5,000-00

3. Overhead water tank with pumps pipe fitting etc.	Rs. 5,000-00
4. Slitting and Rewinding units	10,000-00
(b) <i>Testing Equipment</i>	
Mircrometer, Fensile tester etc.	5,000-00
(c) <i>Electrification & installation charges @ 10% of cost of machine etc.</i>	
	12,000-00
Total cost of machinery & equipment	1,37,000-00
(iii) Cost of office equipment, storage racks etc.	5,000-00
(iv) Preoperative expenses	3,000-00
Total	1,45,000-00

2. Working Capital (Per Month)

(i) Personnel

Production Manager	1	1000/-	1,000-00
Accountant/Cashier	1	400/-	400-00
Clerk-cum-typist	1	300/-	300-00
Peon-cum-Deliveryman	1	200/-	200-00
<i>Technical</i>			
Skilled workers	3	350/-	1,050-00
Unskilled workers	4	250/-	1,000-00
			3,950-00
Perquisite @ 15%			550-00
			4,500-00

(ii) Raw Material including packaging requirement (per month)

Kraft paper (in roll form)—8 M.T. @ Rs. 5500/-	44,000-00
Bitumen— 3 M. T. @ Rs. 2000/-	6,000-00
	50,000-00

(iii) Utilities (per month)

Power 1000 KWH @ 0.25 P per unit	250-00
Water	100-00
Fuel—coal etc. 3 M.T. @ Rs. 200/- per M.T	600-00
	950-00

(iv) Other Contingent expenses (per month)

Rent	2,000-00
Postage & Stationery	150-00
Telephones	50-00
Consumable stores	100-00
Repairs & Maintenance	200-00
Transport charges	500-00
Advertisement & Publicity	200-00
Insurance	200-00
Miscellaneous	150-00
	3,550-00

(v) Total recurring expenditure per month (4500 + 50,000 + 950 + 3550)	Rs. 59,000-00
(vi) Working capital (3 months)	1,77,000-00
III. Total Capital Investment	
Fixed Capital	=1,45,000-00
Working Capital	=1,77,000-00
	<u>3,22,000-00</u>
Say : Rs.	<u>3,22,000-00</u>
V. Cost of Production (per annum)	
Total recurring Cost	7,08,000-00
Depreciation on plant & Machinery 10%	13,700-00
Depreciation on office equipment @ 25%	1,250-00
Interest on total investment @ 15%	48,300-00
	<u>7,71,260</u>
V. Turn over (per year)	
By sale of bituminised laminated paper 120	
M. T. per annum @ Rs. 7,500/- per M.T.	9,00,000-00
VI. Net profit per year	1,29,750-00

7. Net Profit ratio	14%
8. Rate of return	40.3%
9. Break even point	49%
10. Additional information (if any)	
XI. Addresses of Machinery & Equipment Suppliers	
1. M/s. Guru Nanak Industries, Railway Road, FARIDABAD.	
2. M/s. Printpak Machinery Corporation, Link Road, FARIDABAD.	
3. M/s. Industrial Paper Machines (P) Ltd., B-32, Nariman Industrial Area, NEW DELHI-110015.	
4. M/s. Print & Paper (Sales) Pvt. Ltd., 417-A, Waterloo Street, CALCUTTA-1.	
5. M/s. Associated (Packing) Mach. Co., 8, Lanyons Range, CALCUTTA 1.	
6. M/s. Poly Coat Industries, 316, Linghi Chetty Street, MADRAS-600001.	
7. M/s. Modern Water Proofing Machinery Co., BOMBAY.	

(Reserved item Sl. No. 52)

I. Introduction

Calcium silicate is mainly used as an anticaking agent in dust formulations (Mainly DDT wettable formulations), as a filler in rubber industry and also as an insulation material.

Calcium silicate is manufactured from Sodium Silicate, Hydrochloric Acid and Lime.

II. Technical Aspects

(i) Process Outline

Sodium silicate solution is mixed with dilute hydrochloric acid to form Silicic Acid Sol. This is next mixed with lime slurry with steam heating in small quantities and the Calcium Silicate formed is filtered and dried.

(ii) Quality specifications

No ISI standards yet. But main tests are oil absorption and water absorption tests for insecticide formulations.

(iii) Production Capacity (per annum)

- (a) Quantity—120M .T. Tonnes/Annual
- (b) Value Rs. 7,50,000/- @ Rs. 6250/- per M.T.
- (iv) Motive Power (Requirement of H. P.) approx. : 100 H.P.

III. Financial Aspects

1. Fixed Capital

(i) Land and Building

	Rs.
Land—1000 sq. metres @ Rs. 15/- per sq. m.	15,000.00
Built area—100 sq. m./ @Rs. 400/-	
Office, Stores etc.	40,000.00
Working shed—200 sq. m. @ Rs. 250/- per square metre	50,000.00
Total Land & Building	1,05,000.00

(ii) Machinery & Equipment

(a) Production Units

Sl. No.	Description	Ind./ Imp.	Qty.	Price Rs.
1	2	3	4	5
1.	Rubber lined M. S. Cylindrical Mixing Tanks with motor & stirrer 4000 lit. capacity (3 H.P. Motor)	Ind.	2 Nos.	30,000.00
2.	Lime Hixing Tank—M.S. with 3 H.P. motor and stirrer—2500 lit. cap.	„	1 No.	8,000.00

1	2	3	4	5
3.	Sod. Silicate Storage Tank M. S. —8000 Lit. capacity	Ind.	1 No.	12,000.00
4.	Sodium Silicate Dilution Tank 2500 Lit. capacity with motor 2 H. P. & stirrer—M. S.	„	1 No.	8,000.00
5.	Hydraulic Acid Storage Tank—M. S. Rubberlined 4000 lit. capacity	„	1 No.	8,000.00
6.	Boiler — 5 N.H.P. —working pressure 75 Lbs.	„	1 No.	50,000.00
7.	Electrical Drying Ovens with trolleys & trays—Aluminium 100 trays —2' x 3½' —30 K. Watts		3 Nos.	1,20,000.00
8.	Filter Press		1 No.	30,000.00
9.	Platform Scale—500 Vg cap.		1 No.	5,000.00

(b) Testing Equipments

Lab. glass equipments, balance etc. 2,500.00

(c) Electrification & installation charges @ 10% of cost of machine and equipment

27,350.00

Total cost of machinery & equipment etc. 1,00,850.00 or 3 lakhs

(iii) Cost of moulds/other fixtures

(iv) Cost of office equipment/working tables 5,000.00

(v) Pre-operative expenses 5,000.00

Total Fixed Capital (i), (ii), (iii), (iv) & (v) 4,15,000.00

2. Working Capital (Per Month)

(i) Personnel

Designation	No.	Salary Rs.	Total Rs.
(Administrative & Supervisory)			
Manager	1	800/-	800.00
Accountant	1	500/-	500.00
Clerk	1	400/-	400.00
Peon/Watchman	1	200/-	200.00
(Technical—Skilled & Unskilled)			
Chemist	1	800/-	800.00
Supervisors	2	400/-	800.00
Boiler Attendant	1	300/-	300.00
Workers	10	200/-	2,000.00

TOTAL (SALARIES)

5,800.00

+ Prerequisites @ 15% of salary

870.00

Total

6,670.00

(ii) Raw Materials including packaging requirements (per month)

Particulars	Ind.	Qty.	Rate	Value
			Rs.	Rs.
Sodium Silicate	Ind.	20 MT	1000/T	20,000.00
Hydrochloric Acid				
(commercial)	"	10 MT	350/T	3,500.00
Lime	"	5 MT	500/T	2,500.00
Polythene woven bags		500 Nos	5/-	2,500.00
Total cost of raw materials				28,500.00

(iii) Utilities (Per Month)

Power 20000 KWH units @ 0.15 per unit	3,000.00
Fuel (steam/furnace oil) 3 tonnes @ Rs. 1250 per ton	3,750.00
Water 125 Kilolitres @ Rs. 12/- per KL.	250.00
Total cost of utilities	7,000.00

(iv) Other Contingent expenses (per month)

Rent	Rs.
Postage and stationery	L.S. 150.00
Telephone	" 250.00
Consumable stores	" 250.00
Repairs and maintenance	" 250.00
Transport charges	" 500.00
Advertisement & Publicity	" 500.00
Insurance	" 125.00
Taxes	" 125.00
Sales Expenses	500.00
Misc. expenditure	100.00
	2,750.00

(v) Total recurring expenditure (per month) 44,920.00

(vi) Total Working Capital (or 3 months) 1,34,760.00

3. (i) Fixed Capital	Rs. 4,15,000.00
(ii) Working Capital	1,34,760.00
Total (i) + (ii)	5,49,760.00

4. Cost of Production (per year)

Total recurring cost per year	5,39,040.00
Depreciation on building @ 5%	4,500.00
Depreciation on machinery @ 10%	30,000.00
Depreciation on furnaces @ 20-30%	—
Depreciation on moulds	—
Depreciation on Office equipments @ 20%	1,000.00
Interest on total investments @ 15%	82,460.00
Total cost of production	6,57,000.00

5. Turn-over (per year)

Item	Qty.	Rate	Value
		Rs.	Rs.
Calcium Silicate	120 MT	6250/T	7,50,000.00
Total Turnover			7,50,000.00

6. Net Profit per year (5-4) (before Income-tax) 93,000.00

7. Net profit ratio $\frac{\text{Net profit per year} \times 100}{\text{Turnover per year}} = 11\%$

8. Rate of Return $\frac{\text{Net profit per year} \times 100}{\text{Total Investment}} = 16.9$

9. Break even Point (% of total production envisaged)

(i) Fixed Cost

(a) Depreciation (on machine & equipment, tools and fixtures and office equipment)	31,000.00
(b) Rent or Depreciation on Building	4,500.00
(c) Interest on total investment	82,460.00
(d) Insurance	1,500.00
(e) 40% of salary & wages	32,016.00
(f) 40% of other Contingent Expenses (excluding rent & insurance)	11,700.00
Total Fixed cost	1,63,176.00

(ii) Net profit per year (as at S.No. 6) 93000

$$\text{BEP} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{1,63,176 \times 100}{1,63,176 + 93,000} = 63.0\%$$

Where FC = Total Fixed Cost

P = Net profit per year

10. Additional Information

11. Addresses of Machinery & Equipment Suppliers :

1. Boiler

- Jaya & Co., Trichy Road, Coimbatore, Tamil Nadu
- Batliboi & Co., M.G. Road, Ernakulam, Cochin.

2. Other Equipments

- Kerala Engg. Corporation, National Highway, Angamally, Kerala.
- The Ernakulam Engg. Corpo., Palarivattom, Ernakulam, Cochin.
- M/s. Eskyer Engg. Co., (P) Ltd. 6-B, Sullivan Garden Road, Madras.
- M/s. Chemech Engineers (P) Ltd., 16/3, Sterling Road, Madras-34.

12. Addresses of Raw Material suppliers :

1. Sodium Silicate

- National Chemical Co., Cochin-2 (Kerala).
- Rajaram Chemical Co., Cochin-5 (Kerala).
- Vijaya Chemical Corpn., Shertallai, Kerala.
- Malabar Chemical Co., Cochin-2 (Kerala).

(Reserved item Sl. No. 2325)

I. Introduction

Cashew Shell Oil (Cashewnut Shell Liquid) is a versatile raw material. It is a bye-product of cashew processing factories. CNSL and the resins made from it are widely used in laminations, brake-linings, electrical insulations, surface coatings printing inks, etc. and therefore find a ready market. The present price per tonne of CNSL is around Rs. 12,000/-.

Almost all the cashew processing factories are in the small scale sector. These units adopt either the Drum Roasting Method or Hot Oil Bath Process while processing cashewnuts. It is reported that raw cashewnuts contain over 20 per cent oil in the shells. In the Old Drum Roasting Process, much of the oil gets burnt during roasting whereas in the Oil Bath Process about 10% good quality shell oil can be recovered from the oil in the process itself as a bye-product. This oil is of good quality and finds ready market. The shells still contain 10 to 12 per cent oil which can be recovered either by Solvent Extraction or by using Expellers. The oil present in the shells in units where roasting method is followed also contain some quantity of burnt oil which could be recovered by either Solvent Extraction or by Expellers. But the oil extracted from such burnt shells is of inferior quality and does not find ready acceptance in the market and therefore is a cheap product. For purposes of this scheme, CNSL extracted from shells of factories adopting Oil Bath Process is taken into account.

As stated earlier, most of the factories using oil bath process are making their won shell oil. Still as the cashew industry is concentrated in Kerala and Tamil Nadu States, shells of some of these factories are available in the market costing around Rs. 500/- a M.T. Solvent extraction using hexane, though ideal, is not followed in the industry as substantial and regular supply of good quality shells are still not available. The seasonal nature of cashewnut industry also contributes to this. A few units, therefore, have successfully extracted the rest of the oil present in the shells by using ordinary oil-expellers. Taking all the above points into account, this scheme envisages the extraction of 1 tonne of cashew shells per day in one shift, using expellers.

II. Technical Aspects

(i) Present Outline

Raw cashew shell contains over 20% CNSL. In the oil bath process about 10% of the oil is recovered as a bye-product. By using expellers for extraction, it is possible to extract a further quantity of about 10% more from the shells. Thus from 1 tonne of shells from factories using oil bath process upto 100 Kgs. of good quality CNSL could be extracted by using expellers. It is advisable that a small unit of the size given below for extraction and recovery of CNSL is set up adjacent to each good cashew processing unit in view of the economic importance and the ready foreign as well as internal demand for the product.

(ii) Quality Specifications

There is a revised I.S., Specification for CNSL No. I.S. 840/1964.

(iii) Production Capacity (Per annum)

- (a) Quantity 30 Tonnes
(b) Value @Rs. 12,000/- =Rs. 3,60,000 p.a.
(iv) Motive Power 25 H.P.

III. Financial Aspects

1. Fixed Capital

(i) Land & Building	Rs.
Land—500 sq. m. @Rs. 15/- per sq. m.	7,500-00
Built area : Office, Stores etc.—50 sq. m. @Rs. 400/- per sq. m.	20,000-00
Working shed—100 sq. m. Rs. 250/- per sq. m.	25,000-00

Total approximate cost (Land & Building) 32,500-00

(ii) Machinery & Equipment

(a) Production Unit

S.No.	Description	Ind./Imp.	Qty.	Price (Rs.)
1.	Oil Expeller—4.5 Tonne cap./24 hrs. mounted on steel fabricated channel fitted with oil tray, thrust bearings—Main shaft 2½", single helical gear with 20 H.P. motor, starter and all other accessories	Ind.	1	30,000-00
2.	Filter Press—24 plates—25" x 25" with plunger pump	"	1	20,000-00
3.	2 H.P. motor for the Filter Press and Pump etc.	"	2	4,000-00
4.	M.S. Storage Tanks—2500 lit. capacity with lids	"	4	8,000-00
				<u>62,000-00</u>

(b) Testing Equipment		Rs.
Laboratory glass equipments, balance etc.	5,000.00	
(c) Electrification and installation charges @10% of cost of machinery		6,200.00
Total cost of machinery and equipment	73,200.00	
(iii) Cost of moulds/other fixtures		5,000.00
(iv) Cost of office equipment		1,800.00
(v) Pre-operative expenses		
Total Fixed Capital (i), (ii), (iii), (iv) & (v)	1,32,500.00	

2. Working Capital (per month)

(i) Personnel

Designation	No.	Salary	Total (Rs.)
<i>(Administrative & Supervisory)</i>			
1. Manager/Chemist	1	750	750.00
2. Accountant/Clerk	1	500	500.00
3. Peon/Watchman (Technical)	2	200	400.00
4. Supervisor	1	400	400.00
5. Workers	5	200	1,000.00
Total			3,050.00
+ Prerequisites @ 15% of the salary			450.00
Total			3,500.00

(ii) Raw Materials including packaging requirements (per month)

Particulars	Ind/Imp.	Qty.	Rate	Value Rs.
Cashew Shell	Ind.	25M.T.	Rs. 500/-	12,500.00
Misc. Stores		L.S.		1,000.00
M.S. Barrels		25 Nos.	200	3,000.00
Total cost of raw materials				16,500.00

(iii) Utilities (per month)

Power—5000 KWH units @ 0.15 per unit	750.00
Fuel	—
Water	100.00
Total cost of utilities.	850.00

(iv) Other contingent expenses (per month)

	Rs.
Rent	—
Postage & stationery	100.00
Telephone	250.00
Consumable stores	250.00
Repairs and maintenance	250.00
Transport	500.00
Advertisement and publicity	500.00
Insurance	125.00
Taxes	125.00
Sales expenses	500.00
Misc. expenditure	100.00
	2,700.00

(v) Total Recurring Expenditure (per month)	23,550.00
(vi) Total working capital (for 3 months)	70,650.00
(i) Fixed Capital	1,32,500.00
(ii) Working Capital	70,650.00
Total (i) + (ii)	2,03,150.00

4. Cost of Production (Per Year)

Total recurring cost per year	2,82,600.00
Depreciation on building @ 5%	2,250.00
„ machinery @ 10%	8,000.00
„ office equipment @ 20%	1,000.00
Interest on total investment @ 15%	30,000.00
Total cost of production	3,23,850.00

5. Turnover (Per year)

Item	Qty.	Rate	Value Rs.
CNSL	30 Tonnes	12,000	3,60,000.00
Total Turnover			3,60,000.00

6. Net Profit per year (5-4)
(before Income-Tax) 36,150.00

7. Net Profit Ratio : $\frac{\text{N.P. per year} \times 100}{\text{Turnover per year}}$ = 10.0

8. Rate of Return : $\frac{\text{N.P. per year} \times 100}{\text{Total Investment}}$ = 17.8

9. Break-even Point (% of total production envisaged)

(i) Fixed Cost

(a) Depreciation (on machines & Equipments)	9,000.00
(b) „ „ on building	1,000.00
(c) Interest on Total investment	30,000.00
(d) Insurance	1,500.00
(e) 40% of Salary & Wages	16,800.00
(f) 40% of other contingent expenses	12,360.00
Total Fixed Cost	70,660.00

(ii) Net Profit per year (as at S. No. 6)

$$\text{BEP \%} = \frac{\text{FC} \times 100}{\text{FC} + \text{BP}} = \frac{70660 \times 100}{70660 + 36150} = 66.15\%$$

Where FC = Total Fixed Cost
P = Net profit per year

10. Additional Information

11. Addresses of Machinery & Equipment Suppliers

1. M/s. S.P. Engg. Corporation, Fasal Ganj, Kanpur, U.P.	Expellers
2. M/s. Ganesh Expeller Works, 32-37, D. Naoroji Road, Fort, Bombay-1.	
3. M/s. Dhanalakshmi Industries, 204, Suramangalam Road, Salem.	
4. M/s. Wilson Engg. Works, Gamdevi Road, Bhandup. Bombay-78.	Filter Press

12. Addresses of Raw Material Suppliers

Locally available from cashewnut processing industries adopting Shallow Oil Bath Process.

(Reserved item Sl. No. 219)

COPPER SALTS (COPPER NITRATE, COPPER CHLORIDE, COPPER CARBONATE & COPPER OXYCHLORIDE)

I. Introduction

Copper salts are manufactured from Copper Scrap imported as well as Copper Scrap locally available from Hindustan Zinc Ltd., Udaipur.

Copper Carbonate (basic) is used in paints and varnish, pigments, ceramic frits, in the electroplating industry as a source of Copper and in colouring metals, in animal and poultry feeds as a source of Copper and agriculturally as a fungicide for treating seed.

Copper Chlorides —It is used in catalyzing organic reactions, desulphurising agent in petroleum industry in the denitration of cellulose, and for the manufacture of copper phthalocyanines.

Copper Oxychloride—basic Copper Chloride $\text{Cu Cl}_2 \cdot 2\text{Cu O} \cdot 4\text{H}_2\text{O}$

The blue/green crystalline powder is insoluble in cold water. Copper Oxychloride is used as a fungicidal pigment in paint and as a wood preservative. Its principal use is as an agricultural fungicide.

Copper Nitrate $\text{Cu}(\text{NO}_3)_2 \cdot 3\text{H}_2\text{O}$

It is used as a ceramic colour, as a mordant and oxidant in textile dyeing and printing. It gives a black 'antique' finish to copper.

II. Technical Aspects

(a) Process outline (Production details/process of manufacturing).

Copper Carbonate (basic)

The basic Copper Carbonate is precipitated as a green powder by adding Copper Sulphate to a solution of soda ash.

Copper Chlorides

It is prepared by reacting chlorine with red hot copper scrap. The copper chlorides are discharged into a M.S.—Rubber lined tank half filled with water. Cuprous chloride is precipitated, and Cupric Chloride get dissolved. The precipitate is filtered and dried in jacketted pans. Cupric Chloride can be reduced to cuprouschloride by SO_2 or by Zn dust and Hydrochloric acid. Cuprous chloride is dried, powdered and packed.

Copper Oxychloride

It can be made by oxidizing Copper Chloride in air to the basic Chloride (by addition of a little of Caustic Soda).

Copper Nitrate

It is made by dissolving Copper metal in Nitric Acid. A solution is concentrated, crystallised & centrifuged.

All the above Copper Salts are crystallised and centrifuged, clear crystals are packed in 50 Kgs. polythelene bags. Copper Oxychloride is some times sold in the powder form for which the method has to be polioerise.

(b) Quality Specifications (I.S.I./Inspection & quality control etc.

Copper Chloride IS : 70—1950 and others as per market specifications.

(c) Production Capacity (per annum) :

	Copper Nitrate	Copper Chloride	Copper Carbonate	Copper Oxychloride	Total
(i) Quantity	18 Tons	18 Tons	108 Tons	108 Tons	252 Tons
(ii) Value	Rs. 414000	414000	2592000	2484000	5904000
(d) Motive power (Requirement of H.P.) approx. :	30 H.P.				

III. Financial Aspects :

1. Fixed Capital :

(i) Land & Building :

Land	600 sq. metres	15,000
Built area Office,		
Stores, Laboratory etc.	100 sq. metres.	50,000
Working shed	300 sq. metres.	90,000
Total approximate cost (Land & Building)		1,53,000

(ii) Machinery & Equipment :

(a) Production units :

S. No.	Description	Indigenous/Qty. imported	Price (Rs.)
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Common to all Sections

1.	Baby Boilers 100 Kg./hr. evaporation cat	Indigenous 2 Nos.	24,000
2.	Vacuum Pump with motor		
3.	H.P.	1 No.	8,000

Copper Nitrate

3.	Nitric Acid Storage Carboys	40 Nos.	2000
4.	Reaction Vessel—Glass Lined 1½' Dia × 5' height SS with silica immersion heaters.	1 No.	15000
5.	Fume Vent—and side cover partitions for Reaction Vessel		5000
6.	Crystallizer 3' × 2' × 1½' —Stainless steel tank —with steam pipe.	1 No.	6500

Centrifuge 36" Dia Basket Stainless steel with 1 H.P. motor.	Indigenous 1 No.	1500
8. Buchner Funnel SS for wash with nylon cloth	1 No.	2000
<i>Copper Chlorides</i>		
9. Chlorine Cylinders	1 No.	3000
10. Reaction Vessel—Rub- ber lined 3' x 4' x 6'		5000
11. Chlorinator M.S. Fire brick lined with cop- per heating furnace		1200
12. Centrifuge Rubber lined with 1 H.P. Motor		10000
13. Pulveriser or Ball Mill		10000
14. Drying Pan—(Copper) Jacketed		6000
<i>Copper Carbonate</i>		
15. Reactor Rubber lined Tank 4' x 6' x 4'		8000
16. Other machinery as common with other sections.		—
<i>Copper Oxychloride</i>		
17. Items 9, 11 and 12 are used for manufac- ture of Copper Oxy- chloride also.		
18. Air Compressor with 1 H.P. Motor		6000
19. Acid proof Tank 6' Dia x 8' with air in- jectors all over the bottom.		1200
<i>(b) Testing equipment :</i>		
pH Meter, Chemical Balance, Drying Oven, Volumetric and Gravi- metric estimations equipment, etc.		20000
<i>(c) Electrification & ins- tallation charge @ 10% of cost of machine and equipment.</i>		
		17000
Total cost of machi- nery & equipment etc.		186000
<i>(iii) Cost of office equip- ment/working tables etc.</i>		
		20000
<i>(iv) Pre-operative expenses (project cost non-re- fundable deposits) if any.</i>		
		13000
Total fixed capital (i), (ii), (iii) & (iv)		374000

(2) *Working Capital (per month):*

(i) *Personnel*

Designation	No .	Salary	Total	(Rs.)
<i>(a) (Administrative & Supervisory)</i>				
Manager				1000
Analytical Chemist				8000
Clerk				500
Chowkidar				300
<i>(b) (Technical-skilled & un-skilled)</i>				
Production Chemist				900
Supervisors	3	700		2100
Skilled Workers	5	400		2000
Unskilled Workers	10	250		2500
Total (Salaries) (+)				10100
Perquisites		Say		1100
				11200

(iii) *Raw materials including packaging require-
ments (per month) :*

Particulars	Indigenous /Imported	Qty.	Rate	Value (Rs.)
Copper Scrap	Imported and some quantity is indigenous	3.65 Tons	@Rs.30/- per Kg.	179500
Nitric Acid 1.4sp gr	Indigenous	0.3 Ton	@1700/ton	500
Hydrochloric Acid/101 sp.		1.0 Ton	@600 per ton	600
Soda Ash	"	3.0 Ton	@1200 per ton	3600
Caustic Soda	"	1 ton	@5500	5500
Chlorine	"	2.8 Tons	@1540	4320
Packing material	Indigenous			1000
150 Bags—including Polythene bags				
Total cost of raw materials				1,25,020

(iii) *Utilities : (per month)*

Power 400 KWH units @0.50 per unit	Cost (Rs.)	200
Fuel 100 tonnes @Rs. 180 per ton		18000
Total cost of utilities		20000

(iv) *Contingent expenses (per month) :*

Postage & Stationery	500
Telephone	500
Consumable stores	1000
Repairs & Maintenance	2000
Transport Charges	2000
Advertisement & Publicity	1000
Insurance	1000
Taxes	500
Sales Expenses	1000
Miscellaneous Expenditure	1000
	10500

(v) *Total Recurring Expenditure (per month) :*

Staff	11200
Raw Materials	375000
Utilities	20000
Contingent expenses	10500
	416700

(vi) Total Working Capital (on 3 months basis)
 $416700 \times 3 = 12,50,100$ say Rs. 12,50,000

3. Total Capital Investment

(i) Fixed Capital	374000
(ii) Working Capital	1250000
Total Capital Investment	1624000

4. Cost of Production (Per year) :

Total recurring cost per year	5000400
Depreciation on building (if any) @ 5%	7000
Depreciation on machinery & equipments @ 20%	37200
Depreciation on office equipment @ 20%	4000
Interest on total investment @15%	243600
Total cost of production	5292200

5. Turnover (per year) :

Item	Qty	Rate	Value (Rs.)
Copper Nitrate	18 tons	23000 per ton	414000
Copper Chloride	18 tons	23000 per ton	414000
Copper Carbonate	108 tons	24000 per ton	2592000
Copper Oxychloride	108 tons	23000 per ton	2484000
Total Turn-over			5904000

6. Net profit per year (5—4) (before Income-tax) 6,11,800

7. Rate of Return : 37%

8. Break-even Point (% of total production envisaged) 33%

9. Addresses of Machinery & Equipment Suppliers :

- (1) Gohel Chemical Engineering Works, Near Chakodiya Mahadev, Rakhial, Ahmedabad-2.
- (2) Gopal Machine Tools, L-111/112, GIDC Odhav, Ahmedabad.
- (3) Chemtex Engg. Enterprises, L-17, GIDC Odhav, 382415
- (4) Pharmalab Industries, Star Metal Compound, Lal Bahadur Shastri Marg, Vikhroli, Bombay.
- (5) D. Parikh Engineering Works, 115, Marol Ind. Estate, Near Saki Naka, Bombay-59.
- (6) India Equipment Corporation, Andheri East, Bombay-93.
- (7) Gujarat Machinery Manufacturers Ltd., Churchgate Chambers, 32, 34, Veer Nariman Road, Bombay-23.

10. Addresses of Raw Material Suppliers :

Soda Ash & Caustic Soda & Chlorine

- (1) Tata Chemicals Ltd., Mithapur, Saurashtra.
- (2) Saurashtra Chemicals Ltd., Porbunder, Saurashtra.
- (3) Dhrangadhra Chemical Works Ltd., Dhrangadhra, Saurashtra.
- (4) Sahu Chemicals Ltd., Sahpuri, Varanasi.

Copper scrap

It is imported.

Raw materials (Packing Materials)

- (1) Dimple Drums & Barrels (P) Ltd., Gulsunda Village, Rassayam-Kolaba.
- (2) Rumi Plastics, 8-A, Indian Metal Forging & Rolling Mills Compound, L. B. Shastri Marg, Vikhroli-West, Bombay-400 083.

Acid Hydrochloric

- (1) M/s. Dharamsi Morarji Chemical Co. Ltd., 317-21, Prospect Chambers, Dr. Dadabhoy Nauroji Road, Fort, Bombay.
- (2) M/s. J.K. Chemicals Ltd., J.K. Building, Dougall Road, Ballard Estate. Bombay.
- (3) M/s. D.C.M. Chemical Works, Post Box No. 1211, Najafgarh Road, New Delhi.
- (4) M/s. Modern Chemical Industries, G.T. Road, Delhi-Shahdara.
- (5) M/s. Mettur Chemical & Industrial Corporation Ltd. Mettur Dam, R.S. (Salem Dist.).
- (6) M/s. The Cawnpore Chemical Works Ltd., Kanhan, Post Kamptee, (Madhya Pradesh).
- (7) M/s. Tata Chemicals Ltd., Mithapur, Okhamandal (Saurashtra).

Acid Nitric

- (1) M/s. Dharamsi Morarji Chemical Co. Ltd., 317-21, Prospect Chambers, Dr. Dadabhoy Nauroji Road, Fort, Bombay.
- (2) M/s. The D.C.M. Chemical Works, Post Box No. 1211 Najafgarh Road, New Delhi.
- (3) M/s. The Cawnpore Chemical Works Ltd., Anwarganj, Post Box No. 27, Kanpur.
- (4) M/s. Bengal Chemical & Pharmaceutical Works Ltd., 94-Chittaranjan Avenue, Calcutta.
- (5) M/s. The Indian Explosives Ltd., I.C.I., House, 35 Chowringhee, Calcutta.

Acid Sulphuric

- (1) M/s. Tata Iron & Steel Co. Ltd., Jamshedpur.
- (2) M/s. The Dharamsi Morarji Chemical Co. Ltd., 317-21, Prospect Chambers, Dr. Dadabhoy Nauroji Road, Fort, Bombay.
- (3) M/s. The D.C.M. Chemical Works, Post Box No. 1211, Najafgarh Road, New Delhi.
- (4) M/s. Fertilisers & Chemicals (Travancore) Ltd., Udyogmandal P.O. Alwaye.
- (5) M/s. Bengal Chemical & Pharmaceutical Works Ltd., 94-Chittaranjan Avenue, Calcutta.
- (6) M/s. J.K. Rayon, Kamla, Tower, Kanpur.
- (7) M/s. Indian Explosives Ltd., I.C.I. House, 34, Chowringhee, Calcutta.
- (8) M/s. The Dharamsi Morarji Chemical Co. Ltd., Kumhari (Madhya Pradesh).

(Reserved items Sl. Nos. 270, 271, 280 & 281)

COPPER SULPHATE

I. Introduction

Copper Sulphate is an important salt of copper used in bulk in the manufacture of insecticides/weedicides, electroplating, salts soil dressing and in dye industry etc. In a very pure form it is used as laboratory chemical & reagent also.

II. Technical Aspects

Process Outlines

Generally copper scrap is used as raw material. Copper is reacted with sulphuric acid solution. Dilute solution of copper sulphate is then concentrated and allowed to crystallise. Copper sulphate crystallises with five molecules of water of crystallisation. The crystals are then centrifuged and dried. Though pure copper gets reacted with sulphuric acid, the rate of reaction is very slow. The common practice is, therefore, to make oxides of copper first and then it is put to sulphuric acid. In some cases copper scrap is put to sulphuric acid solution and compressed air is continuously bubbled through the mass to keep the whole thing strring so that the oxygen of air can oxides the copper to make it more reactive to sulphuric acid. In certain cases copper scrap is put in reaction tank containing dilute sulphuric acid. This acid is then taken out and recirculated over the leached copper again and again. In this case the exposure of copper surface to the air helps it to get oxidised. The dissolved oxygen in the solution also helps to oxidise copper to make it more reactive. Different processes are adopted taking into consideration the comparative advantages/convenience and the quantity is to be produced with a less initial investment it is better to roast copper scrap in a furnance in present of excess air and to prepare coper oxide with sulphuric acid. The present scheme is based on this process.

Production Capacity (per annum)

(a) Quantity	240 M.T.
(b) Value	Rs. 20,40,000/- Approx.

III. Financial Aspects

(a) Fixed Capital

(b) Land and Building

Land	300 sq. mt.	} Rented. Rs. 1,000/- per month.
Built area Office, Stores etc.	50 sq. mt.	
Working shed	200 sq. mt.	

IV. Machinery and equipments (All indigenous)

		Rs.
(a) Revarabaratory Furnace made of fire brick coal fired heating arrangements with chimney	1 No.	30,000.00
(b) Lead liquid M.S. kettle cap. 1000 lts.	1 No.	25,000.00
(c) Lead liquid Vat 100 lts.	3 Nos.	15,000.00
(d) Wooden rat 300 litres	10 Nos.	4,500.00
(e) Blower 1 H.P. motor		2,500.00
(f) Testing Laboratory		5,000.00
(g) Weighing Scale		5,000.00
(h) Tubewell, water connection, pump motor etc.		6,000.00
(i) Misc. Tools and equipments		1,000.00
(j) Installation of machinery & electricity		10,000.00
(k) Furniture & fixtures		2,500.00
Total Cost of Machinery & equipments		1,06,500.00

V. Working Capital (per month)

(i) Personnel

		Rs.
1. Manager	1 No.	700.00
2. Salesman	1 No.	500.00
3. Clerk/Typist	1 No.	400.00
4. Cashier/Accountant	1 No.	450.00
5. Peon/darwan	1 No.	300.00
6. Chemist	1 No.	1,000.00
7. Skilled workers	3 Nos.	1,200.00
8. Unskilled workers	9 Nos.	2,700.00
		7,250.00
Perquisites @ 15% of salary		1,087.00
		8,337.00

(ii) Raw-Materials (PM) :

		Rs.
(a) Copper scrap—5.3 M.T. @ Rs. 22,000/- P.M.T.		1,16,600.00
(b) Sulphuric acid —8M. T. @ Rs. 800/- P.M.T.		6,400.00
(c) Packaging materials—L.S.		1,000.00
Total :		1,24,000.00

(iii) Utilities :

		Rs.
(a) Power—5KWA		200.00
(b) Coal—20 M.T.		3,000.00
		3,200.00

(iv) Other contingent expenses (per month) :

	Rs.
(a) Rent	1,000.00
(b) Postage/stationery	300.00
(c) Telephone	200.00
(d) Consumable stores	200.00
(e) Repairs/maintenance	300.00
(f) Transport charges	900.00
	2,900.00

(v) Total working capital for (3 month) :

	Rs.
(i) Raw-materials Rs. 1,24,000 × 3	3,72,000.00
(ii) Salary & wages 8,300 × 3	24,900.00
(iii) Utilities Rs. 3200 × 3	9,600.00
(iv) Other expenses 2,900 × 3	8,700.00
	4,15,200.00

(C) Total Investment :

Fixed Capital + Working Capital for 3 months.
=Rs. (1,06,000 + 4,15,200/-)
=Rs. 5,21,200/-

(d) Cost of Production (per month)

	Rs.
Total recurring costs	16,60,800.00
Depreciation on Machinery @ 10%	10,400.00
Depreciation on office equipments @ 20%	500.00
Interest on total investment @ 15%	78,000.00
	17,49,700.00

(E) Turn-over (per year)

	Rs.
(i) Copper sulphate—240 M. T. @ 8,500/- P.M.T.	20,40,000
Less commission (Sales) @ 8%	1,63,200
	18,76,800

(F) Net Profit per year

Rs. : 18,76,800—17,49,700/-
=Rs. : 1,27,100/-

(G) Rate of Return (on capital investment)
24.4%

(H) Break-even point
56%

List of Raw Material Suppliers

1. Khetri—Rajasthan.
 2. Copper scrap can be had from scrap dealers and copper re-rollers.
 3. Sulphuric acid from authorised stockist/distributors manufacturers.
 4. The United Engineers,
61-Simla Road,
Calcutta-6.
 5. Bhaskar Engineer,
Biren Roy Road,
West-Behala,
Calcutta-34.
 6. Anup Engineering Co.,
Local fabricators of equipments &
vessels.
 7. Ralson Industries,
108—
Rewari Line,
Industrial Area,
Phase-I
New Delhi-64.
- (Reserved item Sl. No. 269)

DECORATIVE PAPERS

I. Introduction

Decorative papers are widely employed for packing of presentation articles and gifts. These are also used for nursery education for creating colour sense in the child. Children of higher class can utilise it for their artistic skill. These are also used for making paper decorations like flowers etc. during festive season. Thus there appears to be a fairly good demand for the decorative papers in the country.

II. Technical Aspects

(i) Process Outline

Paper in the form of rolls is fed to a Rotogravure printing machine wherein it is coated with a colour on one side. These are then cut into sheets of suitable sizes, which are passed through a varishing machine for giving it a gloss and shine and making it more pleasing and presentable.

(ii) Quality specifications

As per customer's requirements

(iii) Production Capacity (per annum)

(a) Quantity — 108 M.T.

(b) Value —Rs. 11,88,000 about Rs. 12 lakhs.

Motive Power—20 H.P.

III. Financial Aspects

1. Fixed Capital

(i) Land and Building

Built area :

Office, Stores etc. . . —75 sq. metres.

Working Shed . . . —400 sq. metres (Rented)

(ii) Machinery and Equipment :

(a) Production Unit

1. Rotogravure Printing machine-
30" for two colour print-
ing 1

Rs.

40,000.00

2. Paper varnishing Machine
with drying arrangement
30" x 340" sheet size

34,000.00

3. Paper cutting Machine 42" 1

8,000.00

(b) Testing Equipments :

Physical balance, Metre Scale
Glass apparatus etc.

3,000.00

(c) Electrification and Installation charges

8,200.00

93,200.00

(iii) Cost of knives, tanks etc.

1,800.00

(iv) Cost of office equipments,
furniture etc.

5,000.00

1,00,000.00

2. Working Capital (per month)

(i) Personnel

Administrative and supervisory :

Rs.

1. Manager 1 800 800.00

3. Sales man 1 600 600.00

3. Sales man 1 500 500.00

4. Clerk-cum-typist 1 400 400.00

5. Deliveryman-cum-Peon 2 200 400.00

Technical :

Skilled Workers 4 400 1,600.00

Unskilled Workers 4 300 1,200.00

5,500.00

Perquisites @ 15% of salary & Wages

900.00

6,400.00

(ii) Raw Materials

Rs.

Papers 9MT@Rs.7/-kg. 63,000.00

Ink, Varnish, Thinners etc. 7,000.00

Packing papers etc. 2,000.00

72,000.00

(iii) Utilities

Rs.

Power 2500KWH @ 30 p. per Unit 750.00

Water, fuel etc. 50.00

800.00

(iv) Contingent Expenses

Rent 1,500.00

Postage and stationery & telephone 250.00

Consumable stores 100.00

Repairs and Maintenance 150.00

Transport charges 500.00

Advertisement & Publicity 150.00

Insurance 500.00

Sales Expenses 150.00

Miscellaneous expenditure

3,800.00

(v) Total recurring expenditure (per month)

Rs.

Personnel 6,400.00

Raw Materials 72,000.00

Utilities 800.00

Contingent expenditure 3,800.00

83,000.00

	Rs.
(vi) Working Capital for 3 months	2,49,000·00
Say	2,50,000·00
3. Total Capital Investment	Rs.
(i) Fixed Capital	1,00,000·00
(ii) Working Capital	2,50,000·00
	3,50,000·00
4. Cost of Production (per year)	
Total recurring cost per year	9,96,000·00
Depreciation on Plant & Machinery @10%	9,000·00
Depreciation on fixtures/testing equipment	
@25%	1,200·00
Depreciation on office equipment etc. @20%	1,000·00
Interest on capital Investment @15%	52,500·00
	10,59,700·00
5. Turnover (per year)	Rs.
By sale of Decorative 108MT	11,88,000·00
Papers @ 11,000 per MT	
6. Net Profit (per year)	1,28,300·00
7. Net Profit Ratio 10·8%	
8. Rate of Return 36·6%	
9. Break-Even Point 50%	
10. List of Paper Manufacturers in India	
1. M/s. Titaghur Paper Mills Co. Ltd., Chartered Bank Building, Calcutta.	
2. M/s. India Paper Pulp Co. Ltd., 8, Clive Row, Calcutta.	
3. M/s. Bengal Paper Mills Co. Ltd., 14, Netaji Subhash Road, Calcutta.	
4. M/s. Star Paper Mills Ltd., 27, Brabourne Road, Calcutta.	
5. M/s. Rohtas Industries Ltd., Dalmianagar.	
6. M/s. Ashok Paper Mills Ltd., 8, Dussal Street, Calcutta.	
7. M/s. Orient Paper Mills Ltd., Birla Building, 9/1 R.N. Mukherjee Road, Calcutta.	
8. M/s. Straw Products Ltd., (J.K.) Nehru House, 4, B. S. Zafar Marg, New Delhi-110002.	
9. M/s. Bollarpur Industries Ltd., (Shree Gopal Division), Thapar House, 124, Janpath, New Delhi.	
10. M/s. Orient Paper Mills Ltd. (Amlai, Bhopal) Birla Building, 9/7, R. N. Mukherjee Road, Calcutta.	
11. M/s Rohit Pulp and Paper Mills Ltd., Rohit Chambers, Ghoga Street, Bombay-400001.	

12. M/s. Paper and Pulp Conversions Ltd., 1183/Shivajinagar Fergusson College Road, Poona.
13. M/s. Laxmi Board and Paper Mills Pvt. Ltd., 23, Raman Street, 3rd Floor, Bombay.
14. M/s. Sirpur Paper Mills, Kaghaznagar, Sirpur.
15. M/s. Andhra Pradesh Pulp and Paper Mills Ltd., Rajahmundry.
16. M/s. Mysore Paper Mills Ltd., Bhadravati.
17. M/s. West Coats Paper Mills Ltd., Shreeniwas House Dr. Somani Marg, Fort, Bombay.
18. M/s. Madhya National Paper Mills Ltd., 7, Museum Road, Bangalore.
19. M/s. Punalur Paper Mills Ltd., Ponalur, Travancore.
20. M/s. Seshasaye Paper and Board Ltd., P.O. Cauvery (Salem), Erode.
21. M/s. Sun Paper Mills Co. Ltd., Post Bag No. 2, Cheranmahadevi, Tirunelveli Distt.
22. M/s. Tribeni Tissue Ltd., 3, Middleton Street, Calcutta.
23. M/s. Upper India Couper Paper Mills Ltd., Masjid Roufe, Lucknow.
24. M/s. Chemopulp Tissues, 4—4 Sect. CXII Meerut Road, Ghaziabad.
25. M/s. Swatantra Bharat Paper Mills, 5/7, P.B. Gupta Road, New Delhi.
26. M/s. Gujarat Paper Mills Ltd., Barejadi, P.O. Mandej, Dist, Ahmedabad.
27. M/s. Central Pulp Mills Ltd., Fort Sonagath, Dist. Surat.
28. M/s. Deccan Paper Mills Co. Ltd., Commonwealth Bldg. Poona.
29. M/s. Amaravathi Sri Venkatesh Paper Mills Ltd., P.O. Udaumalpath, Madhathukula, Tamil Nadu.
30. M/s. Associated Pulp and Paper Mills, Ltd., B. Jaday Chambers, 2nd Floor, Ashram Road, Ahmedabad-380009.

11. List of Machinery and Equipment Suppliers

1. M/s. Indo Europa Trading Co., 1396, Chandni Chowk, Delhi-110006.
 2. M/s. Industrial Paper Machines (P) Ltd., A-32, Phase I, Naraina Indl. Area, New Delhi.
 3. M/s. Gunvantrai & Company, Ground Floor, 41 Tamarind Lane, Fort Bombay-400001.
 4. M/s. Associated Packaging Machinery Co., 8 Lyous Range, Calcutta-700301.
- M/s. Bhavani Industries
2, 1st Cross, K. V. Temple Street,
Bangalore-53.

(Reserved item Sl. No. 53).

I. Introduction

Manufacture of dichromate is an item reserved for the small scale sector. There are at present about 14 units making dichromate in the various parts of the country such as Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Orissa, Haryana, Rajasthan, Gujarat. Most of these units make sodium dichromate and recover yellow sodium sulphate as a bye-product.

Some of the units are using as a rotary kilns for the fusion of chromite ore with Soda. While, some use reverbratory type of furnaces. There is same amount of recovery of heat also in the flue gases for being utilised for the concentration of (Chrome Liquor) in the process.

The capacity of the small scale units varies from 2-3 tons of dichromate per day.

The main raw materials required for this industry are chrome ore, soda ash, and sulphuric acid and fuel such as coal lime fuel oil. Chrome ore is available in Orissa and same in Karnataka State. All the raw materials are indigenous.

Dichromates are used in leather, textile and pigments industry. Potassium Dichromate is used in match industry.

Dichromates are starting raw materials for manufacture of chromic acid and basic chrome salts, the first one being used in metal finishing and the latter in leather tanning.

Manufacture of Dichromate attracts excise duty.

Dichromates are also made in the organised sector the units mainly being located in Maharashtra, Uttar Pradesh and Tamil Nadu.

II. Technical Aspects

(i) Process Outline

A mixture of finely divided chrome ore Soda ash and quick lime is heated to redness (approx. 1200 °C) in a furnace under access to free oxygen. The Chromate is then converted into Sodium Chromate. This product obtained after the calcination is treated with water to extract the soluble sodium Chromate. The extract is then filtered to separate the insoluble and then con-

centrated. After concentration it is reacted with sulphuric acid when the cromate is converted to dichromate and sodium. Sulphate is formed as a Bye Product. The solution is allowed to settle to separate the sulphate and filtered. The Bichromate solution is then concentrated. During this process there is a further separation of the sulphate which is filtered. After the necessary concentration of the Bichromate solution is achieved, it is allowed to crystallize. The crystals of the dichromate are then separated by a hydro-extractor.

(ii) Quality Specifications

There are I.S. Standards for Sodium and potassium dichromate. It is reported that small scale product, specially sodium dichromate satisfies the IS standards.

(iii) Production Capacity : (Annual Basis)		Rs.
Sodium dichromate	700 tons @Rs. 7200/ton	Value 50,40,000.00
Sodium Sulphate	450 Ton @500/ton	2,25,000.00
		52,65,000.00

III. Financial Aspects

(i) Land and Building

Value Appx.	Land—3500 sq. m. (2 acres approx.)	Rs.
	@Rs. 20/-	70,000.00
Built Area, Office and Lab.	150 sq. m. (1500 Sq. Ft.) @ Rs. 50/- Sq. ft.	75,000.00
Work shed	750 sq. m. (7500 sq. ft.) @ Rs. 20/-sq. ft.	1,50,000.00
Total appox. cost Land & Buildings		2,95,000.00

(ii) List of Machinery

1. Jaw Crusher with motor and indigenous accessories	15,000.00
2. Pulveriser with motor	65,000.00
3. Elevator and conveyor with motor	40,000.00
4. Weighing platform	10,000.00
5. Mixer-Ribbontype	500 kg cap. 20,000.00
6. Reverbaratory furnace coal fire	2500 kg./day 1,50,000.00
7. Blower-Centrifugal	1600 cft. 10,000.00
8. Leaching tank open Cylindrical	2700 lts each 3 Nos. 25,000.00
9. Solution tank Cylindrical	1000 lts. 20,000.00
10. Filter Press	40,000.00

	Rs.
11. Filtered solution Tank-Open Rectangular masonry(2)	8,000.00
12. Furnace Pans open Rectangular	45,000.00
13. Pump for Strong Chromate Liquor	5,000.00
14. Acid Storage Tank-7000 lts	15,000.00
15. Acid dosing tank	2,000.00
16. Acidification tank-Cylindrical with agitator	25,000.00
17. Settling tank-Rectangular open	12,000.00
18. Hydro extractor for sulphate 2 nos.	
50 kg. cap	20,000.00
19. Thermic Heater Coa Fired	80,000.00
20. Boiling tanks Open cylindrical (2700 Lts. each)	60,000.00 (3 Nos.)
21. Cooling tanks—Retangular open 1000 lts.	15,000.00
22. Crystallizer-Water cooled—1.2 tons cap. s(2)	30,000.00
23. Chromate extractor 2 nos.	20,000.00
24. Pumps. S.S.7	20,000.00
25. Pump pits—3	5,000.00
26. Water Pump 2 nos. centrifugal	4,000.00
27. Solution filter cartridge type centrifugal type	15,000.00
28. Filter pump-screw type 50 lts./m.	3,000.00
29. Laboratory equipment	10,000.00
30. Water softner	10,000.00
31. Piping	20,000.00
32. Office equipment	10,000.00
	8,29,000.00
33. Installation and electrification	82,900.00
	9,11,900.00

2. Working Capital per month

(Personnel) Administrative and Supervisory Staff

Chemist	1	2000/-	2,000.00
Office Manager	1	1500	1,500.00
Office Asstt.	3	400	1,200.00
Typist	1	400	400.00
Watchman	3	200	600.00
Sales Asstt.	1	800	800.00
Accountant	1	600	600.00

Technical : (Skilled and Unskilled)

Chemist	1	1000	1,000.00
Shift Operator	3	500	1,500.00
Furnace Operator	4	500	2,000.00
Skilled Workers	25	400	10,000.00
Semi-skilled workers	25	300	7,500.00
Lab. Asstt.	1	400	400.00

29,500.00

Perquisit sat 15% 4,425.00

33,925.00

Raw Materials (including packing/per month)			Rs.
Chrome Ore	96 tonnes	1100/-	1,05,600.00
Soda ash	54	1400/-	75,600.00
Lime	54	700/-	37,800.00
Magnesia	9	1100/-	9,900.00
Sulphuric acid	24	900/-	21,600.00
Packing cost			6,000.00
			2,56,500.00

Utilities/per month

Power	5,000.00
Coal 135 ton/Rs. 200/ton	27,000.00
Water	2,000.00
	34,000.00

Other Contingent expenses

Postage and stationery	500.00
Telephone	1,500.00
Consumables	1,000.00
Repairs and Maintenance	2,000.00
Transport Charges	3,000.00
Advertisement & Publicity	3,000.00
	11,000.00

Taxes Insurance	1,000.00
	12,000.00

Total working capital for 3 months	33,925.00
	2,56,500.00
	34,000.00
	12,000.00

335425 x 3 =

10,09,275.00

Say 10,10,000.00

Total Investment

Land & Building	2,95,000
Plant & Machinery	9,11,900
Working C. pit: 1	10,10,000
	22,16,900

Cost of Production (per annum)

Total recurring expenditure	40,25,100.00
Depreciation on M/c. @10%	75,190.00
Depreciation on furnace @30%	45,000.00
Depreciation on Office equipment @20%	2,000.00
Interest on total investment	3,32,535.00
	44,79,825.00

Depreciation on Building @5%	11,250.00
	44,91,075.00
Say	4,49,000.00

Receipts**Rs.**

Sodium Dichromate 700 tons @ 7200 pe. M.T. 50,40,000-00
Sodium Sulphate 450 tons@500/- 2,25,000-00

52,65,000-00

Profit per annum
Return on investment . . . 33-0%
Return on Sales . . . 14-0%
B.E.P. . . . 50-0%

Machinery Suppliers

Centrifuge
K. Sitarahmayya & Sons,
Bangalore.

Boiler

Wanson India P. Ltd.
265, Dr. A.B. Road,
Bombay-25.

Other Equipment

Rank & Co.,
Wazirpur Industrial Area,
New Delhi.

Pump and Others
Local Suppliers

(Reserved item Sl. No. 292, 293 and 294).



I. Introduction

The scheme is for the manufacture of coated stencil papers used for the purpose of duplicating copies. There are mainly two types of stencils which are in use these days i.e. typing stencils and pen stencils.

The stencil papers which are coated with a compound of Nitro cellulose are mainly used for duplicating and these stencil papers can produce more than thousand copies per stencil paper.

The estimated demand of the stencil papers in the country is reported to be in the order of 25 lacs quires. The main consumers are the different governmental institutions/offices/establishments and various government/semi government undertakings. They consume more than 55% of the total demand in the country. The rest being consumed by various commercial establishment. Being a consumable item, there appears to be a good scope for this item in the country. The estimated increase in demand every year is reported to the tune of 15%. There is a good export potential for this item in the middle east, south east, gulf and African countries.

II. Technical Aspects

(a) Process Outlines

First the pigments and oil are hand mixed, then ground thoroughly on the triple roll mill to make it in the paste form. This paste is mixed in a high speed mixer, with nitro cellulose, Ether and spirit, Titanium dioxide etc. for nearly an hour. Then this paste is coated on the tissue paper by the stencil tissue coating machine and after the coating it is wound on a receiving roller. The coated paper roll is then taken to stencil collating machine, where the coated paper, interleaving paper and the backing paper, fed simultaneously, are pasted to the tissue paper duly printed and cut to size. All the operations are automatic. The sized stencil papers are then packed in boxes.

(b) Quality Specifications

There is an I.S. specification No. 5086 on the subject.

(iii) Production Capacity (per annum on single shift)

(i) Quantity	4,20,000 quires.
(ii) Value	70,20,000-00
(iv) Motive Power	30 H.P.

III. Financial Aspects

(i) Fixed Capital

(i) Land and Building

Land	500 sq. metres
Built area	100 sq. metres
Office, stores etc. Working Shed	200 sq. metres (Rented)

(ii) Machinery and Equipment

(a) Production unit

1. Triple Roll Mill 15" x16" complete with motor, starter etc.	Indigenous	70,000-00
2. High Speed Mixer complete with motor, starter etc.	"	35,000-00
3. Stencil Tissue Coating Machine 8" x4" x10" with drying arrangement	"	60,000-00
4. Vertical Power Press with Electrical Motor	"	20,000-00
5. Stencil Collating machine (Vortex type 14" x4" x5")	Imported	6,50,000-00
6. Boiler 100 kgs./hr. Evaporation capacity	Indigenous	15,000-00

(b) Testing Equipments

Tensile Testing machine Oven, Chemical Balance, glass equipments etc.	30,000-00
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(c) Electrification & Installation charges

85,000-00

(iii) Cost of office equipments/working tables etc.

15,000-00

9,80,000-00

2. Working Capital (per month)

(i) Personnel

Admn. and Supervisory

Manager	1	1200	1,200-00
Supervisors	2	600	1,200-00
Storekeeper	1	400	400-00
Clerk-cum-typist	2	250	500-00
Salesman	2	400	800-00
Peon-cum-Watchman	2	200	400-00

Technical

Laboratory Assistant	1	400	400-00
Mechanics	2	400	800-00
Skilled Workers	6	300	1,800-00
Semi skilled workers	10	250	2,500-00
Unskilled workers	10	200	2,000-00

12,000-00

Perquisites @ 15 % of salaries

2,000-00

14,000-00

(ii) Raw Materials including packaging requirements

Sr. No.	Item	Quantity	Rate	Amount
1.	Tissue Paper	1000 kgs.	Rs. 150/- kg.	1,50,000.00
2.	Nitrocellulose	666 kgs.	35/-,,	23,310.00
3.	Oleyl Alcohol	1166 kgs.	45/-,,	52,470.00
4.	Backing Sheet	10000 kgs.	8/-,,	80,000.00
5.	Interlining Paper	666 kgs.	16/-,,	10,656.00
6.	Carbon Paper	500 kgs.	16/-,,	8,000.00
7.	Ether	2333 kgs.	7/-,,	16,331.00
8.	Spirit	6000 lit.	3/-lit	18,000.00
9.	Titanium Dioxide	666 kgs.	70/-kg.	46,620.00
10.	Pure Castor oil	666 kgs.	10/-,,	6,660.00
11.	Shell Cornea Oil	833 ,,	12/-,,	7,497.00
12.	Butyl Alcohol	336 ,,	11/-,,	3,696.00
13.	Butyl Acetate	1000 ,,	12/-,,	12,000.00
14.	Dibutyl Phthalate	166 ,,	20/- ,,	3,320.00
15.	Ethyl Acetate	500 ,,	9/-,,	4,500.00
16.	Glue	266 ,,	22/-,,	5,852.00
17.	Ink	26 kgs.	50/-,,	1,300.00
18.	Packing Material			9,788.00
				4,60,000.00

(iii) Utilities

Power & Electricity—10,000 KWH@30 P. Unit	3,000.00
Steam	4,800.00
Water	200.00
	8,000.00

(iv) Other Contingent Expenses

Rent for Building	2,500.00
Postage & Stationery & Telephones	500.00
Repair & Maintenance	1,000.00
Advertisement & Publicity	2,500.00
Transport Charges	2,000.00
Insurance	1,200.00
Consumable Stores	300.00
Miscellaneous Expenditure	2,000.00
Sales Expenditure	2,000.00
	14,000.00

V. Recurring Expenditure (per Month)

Personnel	14,000.00
Raw Materials	4,60,000.00
Utilities	8,000.00
Contingent Expenditure	14,000.00

4,96,000.00

VI. Total Working Capital (3 months)

14,88,000.00

3. Total Capital Investment

Fixed Capital	9,80,000.00
Working Capital	14,88,000.00
	24,68,000.00

4. Cost of Production (per year)

Total recurring cost per year	59,52,000.00
Depreciation on Mach. & Equipment@10%	93,500.00
Depreciation on office Equipments/testing Equipments etc. @20%	9,000.00
Interest on Capital Investment @15%	3,70,200.00
	64,24,700.00
Say	64,25,000.00

5. Turn Over (per annum)

By sale of Duplicating Stencils 4,20,000 quires @ Rs. 17 per quire.	71,40,000.00
Sales Commission	1,20,000.00

70,20,000.00

6. Profit per annum (before Tax) Rs. 5,95,000

7. Net Profit Ratio 8.4%

8. Rate of Return 24%

9. B.E.P. 53%

Name and Addresses of Suppliers of Machinery/Equipment and Raw Materials

- Machinery :
 - Vortex-USA
 - (a) Imported :
 - Machinex V3, Neelakantha 5th floor, 98, Marine Lines, Bombay-20.
 - (b) Indigenous :
 - Corporated Engineers (P) Ltd., Chittaranjan Avenue, Calcutta.
 - (1) Triple Roller Mill & Testing apparatus
 - Kusum Engg. Co. Ltd. Calcutta.
 - Paint & Chemical Process Equipment Co. 99-Apollo St. Bombay.
 - Frigmaris Engineers, Bharat House 104-Apollo St. Bombay.
 - High Speed mixer (disintegrator)
 - Ambika Vijay Works, Inside Nimco Tiles Compound. Indl. Estate, Lal Baugh Bombay-12.
 - APV Engg. Co. Ltd., Calcutta.
 - Chemical Plant & Equipment Ltd., Calcutta.
 - Gansons (P) Ltd., Industry Manor Off. Cadell Road, Bombay-25.
 - Power Press
 - Batliboi & Co. P. P. Road, Secunderabad.
 - Perfect Machine Tools, P. P. Road, Secunderabad.
 - Stencil tissue coating machine.
 - Machinex, V3, Neelakanta 5th Floor 98-Marine lines. Bombay-20.
 - Gansons (P) Ltd. Industry Manor Off Cadell Road, Bombay-25.
 - Raw Materials
 - Desai Chemicals, Sagar Talkies Bldg. Abid Road, Hyderabad.
 - Jaffarji, Valji & Co. 29-New Barden Lane, Mandvi, Bombay-3.
 - Amrutlal, Bhurabai & Co. Anand Bhavan, Princess St. Bombay-2.

(Reserved item Sl. No. 68).

I. Introduction

Fast Colour Bases are used mainly in the textile industries for dyeing. These are manufactured by as many as 10-15 units in small scale and 2-3 large scale units. Even then the demand for these products is increasing with developing textile industries and the gap between demand and supply is now met with by import.

Fast colour bases, as the name suggests are unaffected by light, water, dilute alkali etc. Fast colour bases are available in the market under different trade and chemical names such as Fast Colour G.C. base, Fast orange G.C. base Fast orange G.R. base, Fast scarlet G.G.S. base, Fast scarlet RN base, Fast scarlet RC base, Fast scarlet RCN base, Fast Red RC base, Fast Garnet GBC base etc. Underlying technology for the manufacture of these bases in more or less similar and same machinery & equipment with little or on addition can be utilised for different products. This scheme is based on manufacture of one of the important and popular bases namely Fast Red RC base.

II. Technical Aspects

(a) Process Outline

Raw materials required for the manufacture of Fast Red RC base are as follows:

1. 2 : 5 dichloronitro benzene
2. Methyl Alcohol,
3. Caustic soda
4. Hydrochloric Acid
5. Iron filings

All of the above raw materials are easily available indigenously. Manufacturing process involves methoxylation of 2 : 5 dichloronitro benzene with methanol in presence of alkali. The methoxylated material is then reduced using acid and metal (iron filings) to produce 2 methoxy, 5-chlore aniline or Fast Red RC base. The material is isolated, dried and packed.

(b) Quality Specification

(c) Production Capacity (per annum)

(i) Quantity—15 MT

(ii) Value—Rs. 10,50,000.00

III. Financial Aspects

Rs.

1. Fixed Capital

(i) Land Building

Land	300 sq. meter.	
	@ 15/- meter	4,500
Built area—250 sq. m. @ 225/- divided into Laboratory, Office Stores, Works, Canteen etc.		56,250
		60,750

(ii) Plant and Machinery

Description	Ind/Imported	Qty.	Value
1	2	3	4
			Rs.
1. M.S. Reactor, Cap. 1000 ltrs with M.S. condensor, M. S. receiver, Jacket, One 5 HP motor for stirrer with gear box stands etc.	Indi-genous	one	25,000.00
2. M.S. Reduction-cum-distillation unit cap. 500 ltrs with MS condensor, Jacket, 5 HP motor, gear box with stands etc.	Indi-genous	one	20,000.00
3. Baby Boiler, 100 PSI evaporation Capacity, with motor and other accessories	"	one	12,000.00
4. Bucket type centrifuge made of MS with motor (3 HP) supported on standard shock absorbers etc.	"	one	8,000.00
5. Drier MS with 24 aluminium trays and steam heating arrangements and temperature controlling arrangements.	"	one	8,000.00
6. Fire extinguisher	"	four	2,000.00
7. Miscellaneous tools and equipments	"	15	5,000.00
8. Laboratory equipments:—			
(a) Analytical balance	"	one	1,000.00
(b) Working table fitted with water taps etc.	"	one	2,000.00
(c) Hot plate	"	one	200.00

1	2	3	4
(d) Heating mantles 1, 2, and 5 litre cap.	Ind/Imported 2+2+1		Rs. 2,000.00
(e) Glass apparatus incl. RB flask con- densors, test tubes, filtration unit etc.	one		5,000.00
(f) Vacuum pump with 2 HP motor	one		1,500.00
Water arrangements with pump overhead tank and fitting etc.			10,300.00
			1,02,000.00
Installation & elec- trification charges @ 15% (approx.)			15,000.00
			1,17,000.00
Total fixed capital	=Land & Building+Machinery =60,750/-+1,17,000/- =2,37,750.00 (say Rs. 2,38,000.00)		

2. Working Capital (Per month)

(i) Personnel

Administrative and Supervisory

Designation	No.	Total salary
General Manager	one	1,000.00
Accountant-cum-clerk	one	500.00
Sales-cum-Purchase Officer	one	500.00
Peon	one	200.00
Darwar (night watchman)	one	250.00
		2,450.00

Technical

Manufacturing chemist	one	850.00
Analytical chemist	one	600.00
Skilled worker	two	600.00
Unskilled worker	four	800.00
Peon	one	200.00
Night watchman (darwan)	two	500.00
		3,550.00

Total salary Rs. 6,000.00

Pre-requisites of salaries @20% 1,200.00

7,200.00

(ii) Raw Material

Item	Ind/ Imported	Qty.	Rate (Rs.)	Value
				(Rs.)
1. 2:5 Dichloronitro benzene	Indi- genous	220Kg 1250 Lit	15.00	33,750.00 4.00
2. Methyl Alcohol	"			5,000.00
3. Causic soda (flaskes)	"	500 Kgs.	3.50/-	1,750.00
4. Hydrochloric acid	"	500 Kgs.	75/-	375.00

5. Iron fillings	Indigenous	2500 Kgs.	75.00	15,875.00
6. M.S. Drum of 25 Kg. Cap	"	50 nos.	25.00	1,250.00
7. Miscellaneous chemicals for laboratory etc.	"	LS		1,100.00
				45,000.00

(iii) Utilities (per month)

1. Electricity 2,000 KWH @ 30P unit	600.00
2. Coal	500.00
	1,100.00

(iv) Other contingent expenses

Maintenance/repairs	500.00
Transport/Convenance	500.00
Postage & Stationery	300.00
Advertisement & Publicity	1,000.00
Miscellaneous	500.00
	2,800.00

(v) Total working capital for 3 month Rs. 56,000 × 3 = Rs. 1,68,000.00

3. Total Capital Investment

Fixed capital + Working capital 3 months
Rs. 2,38,000 + 1,68,000
= Rs. 4,06,000.00

4. Total Production cost (per year)

Total recurring expenses—one year	6,72,000.00
Interest on total investment @15% p.a.	60,000.00
Depreciation on building @15% p.a.	2,800.00
Depreciation on machinery & equipment @ 10% p.a.	11,700.00
Sales commission @10%	1,05,000.00
	8,52,400.00

5. Turnover per year

15 M.T. of Fast Red RC Base @70/- per Kg.
=Rs. 10,50,000.00

6. Profit (before taxation)

Rs. 10,50,000.00—8,52,400.00
=Rs. 1,97,600.00

7. Rate of Return—49.5%

8. Break even point—24%

9. A few suppliers of Raw materials

1. M/s. Hindustan Organic Chemicals, Rasayance
2. M/s. Indian Chlorochemicals
2, Kyd St. Calcutta.
3. M/s. Atul Products, Bulsar.

10. A very few suppliers of Machinery

1. M/s. AP. V. Engineers, Jessore Road, Calcutta-28.
2. M/s. Chemical Equipment Works, Calcutta-61.
3. M/s. Bhaskar Engineers, Calcutta-32.
4. M/s. The United Engineers, 61, Rimla Road,
Calcutta-6.

(Reserved item Sl. No. 217)

I. Introduction

Alum is a generic name for double salts of Aluminium Sulphate with either Potassium Sulphate, Sodium Sulphate or Ammonium Sulphate. In the commerce Aluminium Sulphate itself is also called Alum. The manufacture of Alum including Aluminium Sulphate is reserved for small scale sector.

The major production of Alum is of the Ferric Alum which is simply Aluminium Sulphate containing iron obtained from the iron impurity present in the Bauxite ore. Ferric Alum is used for water purifying to a large extent. Alum is also used in paper industry, for dis-infecting after shaving, chemical industries etc. The principal raw materials are bauxite ore and Sulphuric acid. Glue as a Clarifying agent is used to a certain extent. Bauxite ore is available in Rajasthan, Mysore, etc.

Manufacturing Process

Alum is made by dissolving bauxite in Sulphuric Acid. First crude Bauxite is crushed to about 1" size in jaw crusher and then fed into a pulveriser for further grinding. The powdered Bauxite is about 100 mesh size. The powder is charged into a lead lined steel reaction tank (with brick lining). Required Sulphuric Acid of 60% concentration is added and the reaction mass is thoroughly agitated by live steam. A mechanical lead lined stirrer also may be fitted to the reaction vessel for uniform agitation. The temperature is kept 105° C to 115°C by means of steam. Normally an excess of Bauxite is fed to achieve maximum conversion 3 to 4 hours are required for completing the reaction when the specific gravity reaches upto 60° TW. The solution is run to larger setting tank. After setting, the clear solution of Aluminium Sulfate is decanted or filtered in wooden plate and frame press. The bottom mud or press cake is washed with water, and washings can be used in next batch. In the settling tanks flaked glue is also added to facilitate coagulation of suspended materials, if pure Aluminium Sulphate is required, Barium Sulphide is added in the form of black ash to reduce Ferric Sulphate to the ferrous state and effect precipitation of iron. The clear liquor is drawn from the setting tank and sent to concentrator. 8-10 hours are required for concentrating. The

concentrated liquid is taken at this stage to the moulds, where it solidifies on further cooling.

II. Specifications

This product is covered by ISI specification No. 299/1951. The moisture content and impurities like Iron, Titanium, Silica etc. are stipulated to a minimum percentage as per standards.

III. Basis and Presumptions

The cost of machinery and equipment has been taken on the basis of present average ruling price of standard manufacturers. However, in each of the existing units, the actual investment on machinery and equipment is much low for parallel capacities, seldom exceeding Rs. 1,00,000 as the equipment is generally locally fabricated and boilers wherever used are second hand. This improves the profitability further.

The prices of raw materials and finished products are based on those currently in operation for bulk transation by small scale units whose working data has been utilised for preparation of the report. If Sulphuric Acid is made available to small scale units at a more reasonable price, the profitability would improve further. Besides, actual average receipts on sales of Alum are at a higher level and hence the actual profitability is invariably higher. The units are also using spent Sulphuric Acid from Nitrobenzene and Synthetic Detergent plants in substantial quantities and hence these profitability is much better than indicated.

IV. Capacity

5. M.T. per day on single shift basis.

V. Technical Aspects

(A) Land & Building :

(i) Land	1500 sq. metre
(ii) Built up area—	300 sq. metre
	(75 Sq. Mt. for office.
	225 Sq. Mt. for shed.)

(A) rent of Rs. 1,500/- per month has been indicated.

(B) Machinery and Equipment

Rs.

1. Jaw Crusher single toggle type, size 5" x 9" with manganese steel jaws and side plates, heavy duty fly wheel, capacity 1 ton per hr. complete with 5 H.P. Motor & Starter.	1 No.	10,000.00
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		Rs.
2. Pulverisor swing heater, type, 32" size suction blowers, air separator complete with 40 H.P. Motor & starter.	1 No.	35,000-00
3. Digester MS, lead lined tank, capacity 3500 litres, inside lead lined covered with acid proof bricks, fitted with mechanical stirrer operated by 5 HP motor alongwith reduction gear assembly, lead bonded steam coils & discharge valves.	2 Nos.	60,000-00
4. Selfing tanks 3500 litres capacity, conical bottom & lined from inner side with acid proof bricks, with discharge cock & other fittings.	3 Nos.	25,000-00
5. Evaporation tanks M.S. lead lined, fitted with lead bonded steam heating coils, capacity 3500 litres	2 Nos.	35,000-00
6. Boiler coal/oil fired, capacity 300 kgs/hours smoke tube, multi-tubler, vertical working pressure 100 p.s.i.g. boiler complete with fire box, steam generator, water heater motorised feed water pump, standard boiler mounting, fittings, fire doors, & bars ash plate, chimney & refractory etc.		50,000-00
7. Water softening plant	1 No.	10,000-00
8. Sulphuric Acid storage tank, 25 M.T. capacity made from mild steel lead lined with man hole, air vent acid feeding & discharge cock etc.	2 Nos.	20,000-000
9. Acid pump 1 1/2" x 1" complete with 3 HP motor	1 No.	5,000-00
10. Chain hoist & charging bucket with supporting girders	1 No	7,000-00
Total :		2,57,000-00

Testing equipment :

Chemical balance, glass ware & equipment for chemical lab.	10,000-00
Electrification & Installation including pipe lines etc.	20,000-00
Cost of moulds	8,000-00
Cost of office equipments	5,000-00

Total Non-Recurring Exp. **3,00,000-00**

VI. Working Capital (P.M.)

(a) Staff and Labour

1. Factory Manager	1 No. @ Rs. 500	500-00
2. Chemist	1 No. @ Rs. 900	900-00
3. Skilled Workers	3 Nos. @ Rs. 300	900-00
4. Semi-Skilled workers	6 Nos. @Rs. 250	1,500-00
5. Boiler attendant	1 No. @Rs. 500	500-00
6. Clerk-cum-typist	1 No. @Rs. 300	300-00
7. Watchman/Peon	1 No. @Rs. 200	200-00
		4,800-00

(b) Perquisites 15% of

Salaries:	5,500-00
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(c) Raw Materials (on single shift basis) :

	Rs.
1. Bauxite, Indigenus 50MT @Rs. 100 per MT	5,000-00
2. Sulphuric Acid 98% Indigenus 70MT @ Rs. 725 per MT	50,750-00
3. Glue Indigenus	1,250-00
4. Coal 20 MT @Rs. 150 MT	3,000-00
Total	60,000-00

(d) Other Contingent expenditure (P. M. on single shift basis)

(1) Power, water charges	500-00
(2) Taxes & Insurance	300-00
(3) Stationery	200-00
(4) Postage & telephone etc.	500-00
(5) Repairs & maintenance	500-00
(6) Sales expenses	500-00
(7) Rent @1500/- p.m.	1,500-00
(8) Miscellaneous	500-00
Total	4,500-00

(e) Total recurring expenditure(p.m.) (b+c+d) **69,000-00**
Say **70,000-00**

(f) Working capital for two months **1,40,000-00**

VII. Total Investment

(a) Fixed Capital	3,00,000-00
(b) Working Capital	1,40,000-00
Total	4,40,000-00

VIII. Total Cost of Production (Per Year)

1. Total recurring expenditure (per year)	8,40,000-00
2. Depreciation on M/c. & equipment @10%	30,000-00
3. Interest on total investment @14%	61,600-00
Total	9,31,600-00

IX. Turnover Per Year

Ferric Alum 1500 MT @Rs. 725 MT **10,87,500-00**

X. Net Profit Per Year (Before Income Tax) **1,55,900-00**

XI. Rate of Return (on Capital Investment) **35%**
B.E.P. **50%**

Addresses of Machinery Suppliers

1. M/s. Mechanic Mfg. Co. 7
15 Okhla Industrial Estate,
New Delhi-20.
2. M/s. Sethi Engg. Works,
2997 Zorawar Singh Marg,
New Delhi
3. Senco
21/13X Naraina Industrial Estate,
Phase II New Delhi
4. M/s. Kalona Boiler & Chem,
D-9/11 Bhendran Nagar,
[S. V. Road, Malad, Bombay-400064. (Boiler)
5. M/s. Singhasmi Engg. Works,
Industrial Area, Kanpur.

6. M/s. Golden Machinery Corpn.
Dera Baba Nanak Road, Batala.
7. M/s. N.V. Industries Pvt. Ltd.,
Sudha Park, Raja S.C. Malik Road,
Gora, Calcutta.
8. M/s. Indian Equipment Corporation,
2, Ganesh Chandra Avenue
Commerce House,
7th Floor, Room No. 4
Calcutta-17.
9. M/s. Macneill & Beshy Ltd.,
2 Fayrli Place, Calcutta-700001
10. M/s. Rank & Co.,
Wazir pin Inde Estate,
New Delhi-110052.

Raw Materials

1. Delhi Cloth Mills, Chemical Works,
Najafgarh Road, New Delhi-15.
2. Hindustan Copper Ltd., Khetri
3. M/s. Gujarat State Fertilizer Company, Baroda.
4. Bharat Alums & Chemicals, Alwar (Raj.)
5. Hindustan Zinc Ltd, Udaipur.

Bauxite Powder

1. M/s. Dharmendra Bauxite, Himatnagar, Gujarat.
2. M/s. U. K. Kadiwala, Himatnagar

(Reserved item Sl. No. 323)



I. Introduction

Due to the rapid industrialisation taking place in the country, the demand for office stationery is increasing day by day. File covers and file boards assume an important position as a stationery material. These are used for keeping the day to day correspondence, old office records, important papers etc. in order. These are used in huge quantity by governmental offices/establishments, various commercial establishments, traders, schools, colleges etc. every year. Letter heads can be printed on the printing press utilising its spare capacity.

II. Technical Aspects**(i) Process Outline**

Board is first cut to the required size of the file covers or for file-board. For file covers, it is printed as desired and then creased and bended on the bending machine. Necessary attachments if desired are fixed on the covers.

File Boards cut to sizes are pasted with paper. Flaps and tapes are then fixed on the board to give it final shape.

(ii) Quality Specifications

File Covers—IS-5457-1969.

(iii) Production Capacity (per annum)**(a) Quantity :**

File Covers - 8,40,000 Nos.

File Boards - 3,60,000 Nos.

Job work (printing of letter heads)—15 lakh impressions.

(b) Value Rs. 6,15,000

(v) Motive power—2 H.P.

III. Financial Aspects :**(i) Fixed Capital****(i) Land and Building**

Built area.

Office, Stores etc. 30 sq. metres

Working Shed— 70 sq. metres (Rented)

(ii) Machinery and Equipment**(a) Production unit**

1. Board cutter, foot operated dab, front and back guides 42" x 42"	1	2,000-00
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2. Vertical Bending Machine foot operated. 42"	1	4,000-00
3. Corner cutting Machine, foot operated. 8" x 8"	1	1,500-00
4. Gumming Machines	1	1,000-00
5. Printing Press, Platen 11" x 16" Electrification & Installation 10%	1	10,000-00 1,850-00
		20,350-00
Cost of Types, dies etc.		1,650-00
Cost of Office Equipment/ Furniture etc.		3,000-00
		25,000-00

(2) Working Capital (Per Month)**(i) Personnel****(Administrative & Supervisory)**

Manager 1 800 800

Clerk cum typist 1 400 400

Peon 1 200 200

Technical

Skilled 4 400 1600

Unskilled 8 300 2400

5400

Perquisites @ 15% 800

6200

(ii) Raw Materials

Mill Board (Superior quality) 35,000 sheets. 22,750-00
Grey Board (Weighing 3.5 MT Rs. 6/50
per kg.

Card Board 5000 sheets 2,500-00

White Paper 10 Kgs. @Rs. 6/50 650-00
kg.

Tape— 15,000 metres @Rs. 15/- 2,250-00
for 100 metres.

File Cover fittings 70,000 Nos
@Rs. 10/- per 100 Nos 7,000-00

Misc. like Ink, Gum etc. 500-00

35,650-00

(iii) Utilities

Power 250 KWH @30P/units 75-00

Water etc. 25-00

100-00

(iv) Other Contingent Expenditure

Rent	500-00
Postage and Stationery	100-00
Telephone	50-00
Consumable Stores	100-00
Repair and Maintenance	50-00
Transport charges	200-00
Advertisement & Publicity	200-00
Sales Expenses	250-00
Miscellaneous Expenditure	250-00
	1,750-00

(v) Total Recurring Expenditure

Personnel	6,200-00
Raw Materials	35,650-00
Utilities	100-00
Contingent Expenditure	1,700-00
	43,650-00

VI. Working Capital for 3 months	1,30,950-00
Say	1,31,000-00

3. Total Capital Investment :

Fixed Capital	25,000-00
Working Capital	1,31,000-00
	1,56,000-00

4. Cost of Production (Per Year)

Total recurring cost	5,23,800-00
Depreciation on Mech. & Equipment @10%	2,035-00
Depreciation on types, dies etc. @25%	415-00
Depreciation on Office equipment @20%	600-00
Interest on capital Investment @15%	23,400-00
	5,50,250-00

5. Turn Over

By sale of		
File Covers	8,40,000 Nos. @Rs. 50/- per 100 Nos	4,20,000-00
File Board	3,60,000 Nos. @Rs. 50/- per 100 Nos.	1,80,000-00
		6,00,000-00
Job work for printing of letter heads etc. 15 lakh impressions @Rs. 10/- per thousand.		15,000-00

Total Turnover.	6,15,000-00
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5. Net Profit per year. (Before Income Tax)	64,750-00
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6. Net Profit Ratio	10.5%
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7. Rate of Return	41.3%
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8. B.E.P.	55.4%
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9. Addresses of Machinery and Equipment Suppliers

1. M/s. Indo Europe Trading Co. Pvt. Ltd.
(i) 9, Dalal Street, Fort, Bombay-400023.

- (ii) Ganesh Chandra Avenue,
Calcutta-700013

- (iii) 21, Sunkurma Chetty Street,
Madras-600001.

- (iv) 1390, Chandni Chowk Delhi-110006.

2. M/s. Nagpal Industries,
Bartan Market, Sadar Bazar,
Delhi-110006.

3. M/s. Akem. Paper Machines,
D-23, NDSE, Part I, New Delhi-110004.

4. M/s. Gunvantrai & Company,
Ground Floor, 41, Tamrind Lane,
Fort, Bombay-400001.

5. M/s. Acme Co.
81-A, Dhanji Street, Bombay.

6. M/s. Shri Krishna Engineering Works,
Begurpura, Kinkhabwala Wadi,
Near Vankar, Sangh, Surat.

7. M/s. Anna Engineering Works,
Quilon (Kerala)

LIST OF PAPER MANUFACTURERS IN INDIA

1. M/s. Titaghur Paper Mills Co. Ltd.,
Chartered Bank Building, Calcutta.

2. M/s. India Paper Pulp Co. Ltd., 8, Clive Row,
Calcutta.

3. M/s. Bengal Paper Mills Co. Ltd., 14, Netaji Subhash Road,
Calcutta.

4. M/s. Star Paper Mills Ltd.,
27, Brabourne Road, Calcutta.

5. M/s. Rohtas Industries Ltd., Dalmianagar.

6. M/s. Ashok Paper Mills Ltdl.
8, Russel Street, Calcutta.

7. M/s. Orient Paper Mills Ltd., Birla Buildings,
9/1 R.N. Mukherjee Road, Calcutta.

8. M/s. Straw Products Ltd, (U.K.) Nehru House,
4, B.S. Zafar Marg, New Delhi-110002.

9. M/s. Balarpur Industries Ltd., (Shree Gopal Division),
Thapar House, 124, Janpath, New Delhi.

10. M/s. Orient Paper Mills Ltd.,
(Amlai, Bhopal) Birla Building, 9/7, R. N. Mukherjee
Road, Calcutta.

11. M/s. Rohit Pulp and Paper Mills Ltd., Rohit Chambers,
Ghoga Street, Bombay-400001.

12. M/s. Paper and Pulp Conversions Ltd., 1183/Shivajinagar,
Fergusson College Road, Poona.

13. M/s. Laxmi Board and Paper Mills Pvt. Ltd.,
23, Raman Street, 3rd Floor, Bombay.

14. M/s. Sirpur Paper Mills, Kaghaznagar, Sirpur.

15. M/s. Andhra Pradesh Pulp and Paper Mills Ltd.,
Rajahmundry.

16. M/s. Mysore Paper Mills Ltd., Bhadravati.

17. M/s. West Coasts Paper Mills Ltd.,
Shreeniwas House, Dr. Somani Marg,
Fort, Bombay.

18. M/s. Madhya National Paper Mills Ltd.,
7, Museum Road, Bangalore.

19. M/s. Punalur Paper Mills Ltd., Punalur, Travancor
20. M/s. Seshasaya Paper and Boards Ltd.,
P.O. Cauvery (Salem), Erode.
21. M/s. Sun Paper Mills Co. Ltd., Post Bag No. 2,
Cheranmahadevi, Tirunelveli Distt.
22. M/s. Tribeni Tissue Ltd., 3, Middleton Street, Calcutta.
23. M/s. Upper India Couper Paper Mills Ltd,
Masjit Booh, Lucknow.
24. M/s. Chemopulp Tissues, 4-4 Sect. CXII, Meerut Road,
Ghaziabad.
25. M/s. Swatantra Bharat Paper Mills, 5/7, P.B. Gupta Road,
New Delhi.
26. M/s. Gujarat Paper Mills Ltd., Barejadi, P. O. Mandej,
Distt. Ahmedabad.
27. M/s. Central Pulp Mills Ltd., Fort Sonagath, Dist. Surat.
28. M/s. Deccan Paper Mills Co. Ltd. Commonwealth Bldg.,
Poona.
29. M/s. A maravathi Sri Venkatesh Paper Mills Ltd.,
P.O. Udaimalpeth, Madathukula, Tamil Nadu.
30. M/s. Associated Pulp and Paper Mills Ltd., B. Jadav
Chambers, 2nd Floor, Ashram Road, Ahmedabad-380009.

(Reserved item Sl. Nos. 80, 81)





I. Introduction

Fumaric acid is used as an important food acidulant and a drug intermediate in the manufacture of ferrous fumarate. The later is a potential drug in the treatment of certain anemias and in iron deficiencies. Besides, its major use is coming up now-a-days in the field of alkyd resin where it replaces maleic anhydride to give varnishes and lacquers having selective properties.

II. Technical Aspects

(a) Process Outlines

Maleic anhydride is dissolved in water in a rubber lined mild steel dissolver to give a maleic acid solution of about 56-57% in maleic acid. Reaction is carried out in a S.S. reactor initially with a part of maleic acid solution in presence of isomerisation catalyst at a reaction temperature of 68-72°C. The reaction is finished by slowly adding the rest of maleic acid and catalyst solution over a period of 2-1/2 hours. The fumaric acid mixture is cooled by circulation of water and centrifuged. Crystals are washed with water once and dried in tray dryer at 110 C to get the final product for storing in fibre bags. For pharmaceutical use, another washing is required.

(b) Quality Specification

IS : 6793-1972

(c) Production Capacity (per annum)

(i) Quantity — 300 M. tonnes

(ii) Value — Rs. 3600,000.00

III. Financial Aspects

(i) Fixed Capitals

(1) Land and Buildings

Land : 1000m²Built area (Office-stores etc.) —60 m²Work shed —250 m²

Total approx. cost of land & building.—Rs. 1,25,000.00

(ii) Machinery & Equipments

Description	Qty. req.	Price Rs.
(a) Dissolver, rubber lined M.S.	1	42,000.00
(b) Reactor, S. S.	1	60,000.00
(c) S. S. Agitator with gear box motor	2	50,000.00

		Rs.
(d) Centrifuge, S. S. (Spring mounted)	1	35,000.00
(e) Tray dryer with two sets of At. trays	1	20,000.00
(f) Centrifugal pump	3	15,000.00
(g) Tank, Rubberline, M.S.	1	25,000.00
(h) Cooling tower	1	8,000.00
(i) Water treatment plant	1	10,000.00
(j) Boiler	1	20,000.00
(k) Cost of installation electrification piping and insulation	—	32,000.00
Total cost of installed machinery and equipment		3,27,000.00

2. Working Capital (Per Month)

(i) Personnel (per month)

Designation	No. of posts	Rate p.m. Rs.	Amount Rs.
<i>Admn. and Supervisory</i>			
1. Technical Manager	1	2,000.00	2,000.00
2. Accountant/clerks	2	800	1,600
3. Peon/Watchman	2	250.00	500.00
<i>Technical</i>			
4. Chemist	1	600.00	600.00
5. Operator	2	500.00	1,000.00
6. Fitter	1	400.00	400.00
7. Unskilled workers	5	200.00	1,000.00
			7,100.00
Perquisites @ 20% of salaries			1,400.00
			8,500.00

(ii) Raw Material requirements (per month)

Maleic anhydride	23 M.T.	@ 9200.00 per M. T.	2,11,600.00
Catalyst	0.245	35,000.00 M. T.	8,400.00
		less	
			2,20,000.00

(iii) Utilities (per month)

	Rs.
Power	300.00
Water	200.00
Chemicals for quality control	500.00
	1,000.00

(iv) Other Contingent expenses (per month)	Rs.
Postage Stationery	200.00
Telephone Bill	250.00
Consumable Stores	150.00
Repairs & Maintenance	700
Transportation charges	1,000.00
Adv. & Publicity	3,000.00
Miscellaneous expenses	1,700.00
Total	7,000.00

(iv) Total working capital (per month)
(i)+(ii)+(iii)+(iv) Rs. 2,35,500.00

Total working Capital on three months basis
Rs. 7,06,500.00

(3) Total Capital investment	
Fixed capital	Rs. 4,52,000.00
Working Capital	7,06,500.00
Total	11,58,500.00

(4) Cost of Production (per year)

Total recurring cost	28,26,000.00
Depreciation on machinery & equipment @ 10%	32,700.00
Depreciation on building @ 5%	4,000.00
Interest on total investment 15%	1,73,800.00
Total cost of production	30,36,500.00

(5) Turnover per year

Fumaric Acid 300 M. T. @ Rs. 12,000/- per M.T.
36,00,000.00
5,63,500.00

(6) Profit per year (before taxation)

(7) Return on investment —48%

(8) Break even point —36%

9. Supplier of raw material

1. Advesh Chemical Ltd.,
Udhana, Dt. Surat, Gujarat.
2. Through Imports also.

10. Suppliers of Machinery

1. Anup Engineering Works,
Odhay Road, Ahmedabad.
2. K. S. Seetaramaiah & Sons,
29/1, Javeaganahalli, 6th mile,
Kanakapwea Road,
Bangalore-560011
3. Larsen & Toubro Ltd.,
Gulab Bhavan, 6, Bahadur Sh. Zfr. Marg.,
New Delhi-110002
4. Akay Pump Industries,
Bombay.
5. Paharpur Cooling Towers (P) Ltd.,
26, Prithi Niraj Road,
New Delhi-110011
6. Industrial Boilers (P) Ltd.,
701/C, Poonam Chambers,
Dr. Annie Basant Road,
Worli, Bombay-400018
7. Ion Exchange (India) Ltd.,
308, Bhandari House, Nehru Place,
New Delhi-110024.

(Reserved item Sl. No. 243)

I. Introduction

High purity chemicals known as laboratory chemicals and reagents have a very wide consumption in the country. They are virtually needed by every industry—chemical or non-chemical for testing, process control, analysis, research and development work. Substantial quantities of these reagents are used every year by educational institutions and research laboratories. Significant quantities of some of these chemicals are still being imported. With the rapid progress in setting up of various industrial and research laboratories, a need has been felt for more industries, especially in the tiny sector and small scale sector for the production of some of the common types of laboratory chemicals and reagents.

This scheme is illustrative of the manufacture of laboratory chemicals and reagents (inorganic salts etc.) and outlines the requirements for the manufacture of some typical chemicals of laboratory reagent.

Raw materials required for the manufacture of these chemicals are indigenously available. Machinery required for the purpose can be easily fabricated from the machinery manufacturers for chemical industries.

II. Technical Aspects

(a) Process Outlines

The starting materials for the manufacture of the high purity products (laboratory reagents) are the commercial/technical grade chemicals, which are readily available in the market. The process involves purification of these chemicals to specified international standards. The common methods of purification comprise distillation (including fractional distillation and vacuum distillation—for liquid reagents) and sublimation, crystallisation, fractional crystallisation, by reducing or increasing the temperature, recrystallisation, extraction and chromatographic absorption. In some cases volatile impurities may be removed by heating. Colouring matter may be removed by dissolving the material in suitable solvent and treating it with activated charcoal etc. and filtration. In some cases the impurities may be removed by formation of derivatives from which the purified material is recorded.

Depending on demand different reagents may be manufactured by the same equipment and machinery. While preparing this scheme Oxalic Acid, Succinic acid, Potassium Iodide, Potassium bromide, Sodium dichromate, Silver nitrate, Ferrous sulphate, Aluminium sulphate, Ammonium sulphate, Calcium chloride, Potassium Nitrate, Sodium nitrate, Sodium Oxalate etc. were kept in view.

For illustrations, we have divided above mentioned reagents, into two more classes depending on their common properties.

- (i) Aliphatic organic acids : Oxalic acid,
Succinic acid.
- (ii) Salts : Potassium Iodide, Potassium bromide, ferrous sulphate, Ammonium sulphate, aluminium sulphate, Sodium dichromate, Silver nitrate, Calcium chlorides, Potassium nitrate and Sodium nitrate, Sodium Oxalate, Zinc sulphate etc.

General outline of the process involved for each of the category is described below :—

Aliphatic Organic Acids

Technical grade oxalic acid and succinic acid usually contain some colouring materials as impurities alongwith some colourless aliphatic and aromatic impurities.

The coloured technical trade material is first dissolved in distilled water and is treated with about 2% activated charcoal and then passed through an efficient filter (S.S.) preferably through an asbestos bed. The solution must be transparent at this stage. Now it is concentrated by heating in steam heated enamel evaporators upto suitable concentration and transferred to crystallisers. After proper crystallisation it is centrifuged by basket type SS centrifuge. Clear crystals may be dried now in an electrically heated drier so as to remove excess moisture etc. (if any organic aromatic impurity is there then it may also be subjected to solvent extraction) (Alternatively acid is dissolved in alkali to make Sodium salts and filtered and acidified with dilute acids and crystallised). Dried crystal may be packed as such or after pulverising upto a definite mesh

size and packed in suitable glass or polythene containers.

Salts

Purification of salts is carried out in different ways depending on impurities present. In general commercial grade material is dissolved in water, filtered and treated with activated charcoal to remove the colour. Even if some colour or some organic impurity is there, it may be removed by giving two or three washing of suitable organic solvents as Benzene, Toluene, Carbon Tetrachloride etc. which may be recovered later. The clear solution may now be concentrated and crystallised suitably. Crystals are now removed from water by centrifuging or otherwise, dried and packed.

(b) Quality Specifications

Indian specification has laid down various standards for different laboratory reagents. Usually laboratory reagents must contain at least 99.8% active reagents and some impurities within permissible range.

(c) Production capacity (per annum) (Based on only four products)

Item	Qty	Value
1. Sodium dichromate	6000 Kg	3,00,000.00
2. Potassium nitrate LR	12000 Kg	2,40,000.00
3. Ammonium sulphate LR	12000 Kg	1,20,000.00
4. Barium chloride LR	12000 Kg	1,92,000.00
		8,52,000.00

III. Financial Aspects

1. Fixed Capital

(i) Land 250 sq. metres @ Rs. 15	3,750.00
Building-150 sq. metres @ Rs.200	30,000.00
	33,750.00

(ii) Machinery & Equipment (all indigenous)

Description	No.	Value Rs.
FRP vessel 250 litre conical bottom with a stirrer driven with 3 HP motor.	1 No.	10,000.00
SS tank with stirrer driven with motor (2 HP) capacity 500 ltr.	1 No.	10,000.00
SS Bucher type filtration unit capacity 25 ltr.	1 Set	,000.00
Vacuum pump with 5 HP motor.	1 No.	7,000.00
SS Evaporator with steam heating arrangement Cap. 150 ltrs.	3 No.	15,000.00
Baby boiler with all accessories 50 kg evaporation 100 Psi.		8,000.00
SS crystalliser, with a slow speed stirrer and water cooling arrangement Cap. 250 ltrs.	3 Nos.	21,000.00
Centrifuge SS with 3 HP motor cap. 10 kg.	1 No.	8,000.00

Drainer, 24 trays (made of aluminium) with electrically heated thermostatically controlled heating arrangement	1 No.	15,000.00
Pulveriser with 10 HP motor capacity 20 kg/hour, 250 mash size.		12,000.00
Bottle washing machine		15,000.00
Water arrangements.	L. S.	5,000.00
Laboratory	L. S.	15,000.00
Fire fighting and first aid arrangement.		5,000.00
Misc. tools/equipment.		6,000.00
Office equipment & furniture		10,000.00
Electrical installation & erection		22,000.00
		1,82,000.00

Total fixed capital = Land + Bldg. + Machinery
= Rs. 33,750 + 1,82,000 = Rs. 2,15,750 Say 2,16,000

2. Working Capital (per month.)

(i) Personnel

General Manager	1	1,500.00
Manufacturing Chemist	1	1,200.00
Analyst	2	1,500.00
Accountant-cum-clerk.	1	500.00
Steno-cum-typist	1	350.00
Peon	1	200.00
Darwan	1	250.00
		5,500.00
Skilled workers	4	1,600.00
Unskilled workers	8	2,000.00
Peon	1	250.00
Darwan	1	250.00
		4,100.00

Total Salary & Wages = 5500 + 4100 = 9600

Add. 20 % perquisites 1,900.00

11,500.00

(ii) Raw Material per month.

Item	Qty	Rate (Rs.)	Value (Rs.)
	Kg.		
1. Sodium dichromate (tech)	600	16	9,600.00
2. Potassium nitrate (tech)	1200	7	8,400.00
3. Ammonium sulphate	1200	1.50	1,800.00
4. Barium chloride	1200	4	4,800.00
5. Activated charcoal	25	4	100.00
6. Asbestos	L.S.		100.00
7. Miscellaneous	L.S.		1,000.00
8. Packing materials, polythene bags to be placed in card board boxes.	L.S.		2,000.00
			27,800.00

(iii) Utilities

Power approx 2500 KWH @ 0.40 P.	1,000.00
Water	200.00
Coal	500.00
	1,700.00

(iv) Other contingencies

Maintenance/repair	500.00
Transport/Conveyance	500.00
Advertisement/publicity	2000.00
Postage/stationery	500.00
Misc.	1,000.00
	4500.00

Total working capital = i + ii + iii + iv

= 11,500 + 27,800 + 1,700 + 4,500

= 45,500/—

Three months working capital = Rs. 1,36,500/—

3. Total investment = 2,16,000/- + 1,36,500/—
= Rs. 3,52,500/—

4. Expenditure per month.

Recurring expenditure per year	5,46,000.00
Interest on capital @ 15%	53,875.00
Depreciation on machinery @ 10%	17,200.00
Furniture & Fixture @ 20%	2,000.00
Depreciation on shed @ 5%	1,500.00
	6,20,575.00
Say	6,20,000.00

5. Turn over per year

Item	Qty	Rate (Rs.)	Value (Rs.)
	Kg.		
Sodium dichromate (LR)	6000	@ 25/— per 500 gram	3,00,000.00
Potassium nitrate (LR)	12000	@ 10/— per 500 gram	2,40,000.00
Ammonium sulphate (LR)	12000	@ 5/— per 500 gram	1,20,000.00
Barium chloride (LR)	12000	@ 8/— per 500 gram	1,92,000.00
			8,52,000.00
Less sales commission			85,200.00
			7,66,800.00

6. Profit per year

= 7,66,800 — 6,20,000 = 1,46,800

7. Rate of Return = 40.5%

8. Break even point—60%

Suppliers of Raw materials

From Stockists/distributors of required chemicals.

Suppliers of machinery & equipment

1. M/s. Chemical equipment Works,
69 Sarsuna Main Road, Calcutta-61.
2. M/s. Glasgow Engineers, B. L. Shah Road,
Calcutta-53.
3. M/s. Wansons (Pvt.) Ltd. Delhi, Bombay, Madras &
Calcutta.
4. M/s. Lason & Company, 1663/1 S. P. Mukherjee Marg,
Delhi-6 (for boilers only).

(Reserved item Sl. Nos. 157, 158, 159, 160, 161, 163,
164, 165, 166, 167, 170, 171, 172, 173, 174, 175, 176,
177, 179, 180, 182, 183, 184, 185, 186, 187, 188, 206,
207, 209, & 210).

I. Introduction

Raw materials for manufacture of Anhydrous lanolin are wool grease, acid bleaching agents like Peroxide and sodium chlorite. Wool grease of good quality is not available in our country and as such this material is imported. Lanolin is used in cosmetics and pharmaceutical formulations. Commercial lanolin is used for rust prevention purposes.

II. Technical Aspects

(a) Process Outline

Crude wool grease is treated with alkali to remove free acid present and washed with water to remove excess alkali. Neutral fat is treated with Hydrogen peroxide and other bleaching agents. Water and lanolin are separated from each other by use of selective solvents like carbon tetrachloride, alcohol etc. Final product is checked for thermal cracking, ash melting point, saponification value, iodine value, free acidity and colour.

(b) Quality Specification

The product coming under purview of cosmetic and pharmaceutical must conform to IP Specification and the industrial grade other than IP quality may be treated as commercial quality which should conform to IS : 5340-1964.

(c) Production capacity (per annum)

(a) Quality—72 m Ton

(b) Value—Rs. 15,72,000/—

III. Financial Aspects.

1. Fixed Capital.

(i) Land and Building

	sq. mt.	Rs.
Land	300	700.00 P.M
Built, area, office stores, etc.	50	(Rental)
Working shed	200	

(ii) Plant & Machinery

1. Steam Jacketted M. S. Kettle with stirrer of 3. H. P. motor, and other complete accessories	1 No.	25,000.00
2. S. S. Centrifuge 20" dia basket 3 HP motor etc.	1	30,000.00
3. S. S. Vat capacity 100 lts.	5	7,500.00
4. S. S. solvent recovery still steam heated arrangement capacity 200 lts.	1	12,000.00

5. Steam jacketted bleaching treatment S. S. kettle with tirror of 2 HP motor capacity 700 litres.	1	25,000.00
6. Boiler 100 PSI 200 to 250 kg. evaporation per hour with chimney and other accessories 1 HP motor.	1	20,000.00
7. Misc. tool and equipment		2,000.00
8. Testing laboratory		5,000.00
9. Weighting scale		5,000.00
10. Fire extinguisher		1,000.00
11. Installation of machinery		14,000.00
12. Tube well water arrangement and pump etc.		6,000.00
13. Furniture and fixture.		2,000.00
		1,54,500.00
Say	Rs.	1,55,000.00

(2) Working Capital

(i) Personnel

Admn & Supervisory	No.	Rs.
Manager/Sales executive	1	700.00
Clerk/Typist	1	400.00
Cashier/Accountant	1	450.00
Peon/Darwan	1	300.00
Technical Chemist	1	1,000.00
Skilled workers	2	700.00
Unskilled workers	4	1,000.00
		4,550.00
Perquisites @ 15% of salary		682.00
Total		5,232.00

(ii) Raw material including Packaging materials (per m.)

(a) Crude Lanolin (Indigenous)	
10 M. T. @ 8000/—	80,000.00
(b) Bleaching Agents like Hydrogen Peroxide, Hexameta phosphate, liquor ammonia, caustic soda and acid etc.	5,000.00
(c) Solvent 1000 litres	5,000.00
(d) Packaging materials	5,000.00
Total	95,000.00

(iii) Utilities

Power 8 kw	320.00
Coal—7 M. T.	1,050.00
	<u>Rs. 1,370.00</u>

(iv) Other Contingent expenses (per month)

Rent	700.00
Postage/stationery	300.00
Telephone	150.00
Consumable stores	100.00
Repairs/maintenance	100.00
Transport charges	1,000.00
Advertisement/publicity	200.00
	<u>Rs. 2,550.00</u>

(v) Working Capital for 3 months

	Rs	Rs
(i) Raw materials	$95,000 \times 3 =$	2,85,000.00
(ii) Salary & wages	$5,232 \times 3 =$	15,696.00
(iii) Utilities	$1,370 \times 3 =$	4,110.00
(iv) Other contingent	$2,550 \times 3 =$	7,650.00
		<u>3,12,456.00</u>
Say		<u>4,67,000.00</u>

3. Total Investment**4. Production Cost (Per year)**

	Rs.
Total recurring cost	12,49,824.00
Depreciation on machinery @ 10%	15,250.00
Depreciation on office furniture and equipment.	400.00
Interest on total investment @15%	70,042.00
	<u>Rs. 13,35,516.00</u>

5. Turn over (per year)

(i) Lanolin 72000 kg. @ 21000 M. T.	15,12,000.00
Less sales commission @ 5%	75,600.00
	<u>14,36,400.00</u>

6. Net profit (per year) (Before taxation)

Rs. 1,00,884/-

7. Rate of return (on capital investment) 21.6%.**8. Break even point****9. Suppliers of Raw materials
Wool grease**

1. M/s. Dunlan Bros. & Co., 1
Netaji Subhas Road,
Calcutta-1.

2. Also through imports.

Hydrogenperoxide

1. National Peroxides Ltd.,
Sewri Cross Road, Vadala, Bombay-31.

2. Arat Electro Chemicals (P) Ltd.,
311/3, Rakhail Road, Ahmedabad-21

10. Machinery Suppliers

1. Setty Engg. Works,
27772, Singh Marg, Delhi-6.

2. Chemical Equipment Corporation,
19, Sarshuna Main Road,
Calcutta.

3. Gansons (P) Ltd.,
Bombay.

(Reserved item Sl. No. 247).

I. Introduction

Naphthol dyes and its bases are widely used for dyeing fabrics in the textile industry. A range of Naphthols are produced and marketed in the country, the following being of major importance :—

Type of Naphthols	Colour index No.
Naphthol ASSW	37565
Naphthol ASD	37520
Naphthol G	37610
Naphthol AS	37505
Naphthol ASBS	37515
Naphthol ASG	36710

Naphthols are also used as intermediates for production of some dyestuffs.

II. Technical Aspects**(a) Process Outline**

Naphthol ASG : Naphthol ASG is prepared by the condensation of Ortho Toluidine with Aceto Acetic Ester. Xylene is charged in the reaction vessel and warmed to the desired temperature. O_2 base is added and the contents are continuously stirred till the temperature reaches upto 85°C . Aceto Acetic Ester is then added to the reaction mass and heating further continued to attain the desired temperature. After 3 to 4 hours, the mass is gradually cooled in the reaction vessel, centrifuged, dried, pulverised and packed. For a batch size of 40 kgs. Naphthol ASG, the following inputs are needed :—

Orthotoluidine	24.6 kgs
Acetoacetic Ester	35.6 kgs.
Xylene	30.8 kgs.

Naphthol ASG can also be prepared from Diketene and Acetoacetic Ester.

Naphthol AS and Naphthol ASBS

The process in essential is that of formation of an amide, analide or para nitro analide of Beta Oxy Naphthoic Acid. In brief, it consists in adding 4 Mol. of Phosphorous trichloride to a mixture of 1 Mol of BON acid and 1 Mol of aniline. This is for preparation of Naphthol AS.

If aniline is replaced by 1 Mol of para nitro aniline, the product will be Naphthol ASBS. Both the reactions need 10 Mol of Toluene. The reaction mixture is boiled for some time, cooled and neutralised. Toluene is recovered, Naphthols AS or ASBS, as the case may be, is filtered off, dried and pulverised.

(b) Quality Specifications

There are no Indian Standard specifications for any type of Naphthols. The manufacturers may, therefore, produce the items as per the buyer specifications.

(c) Production Capacity (per year)

Item	Qty.	Value
Naphthol ASG	12 tons	Rs. 19,20,000.00
Naphthol As	6 tons	7,80,000.00

III. Financial Aspects**(1) Fixed Capital****(i) Land & Building**

Land — 250 sq. m.	
Built up area, working shed office, stores etc. (Rented) — 2,500 sq. m.	2,500.00

(ii) Machinery & Equipment

1. Reaction, Kettle, stainless steel, Cap. 1,000 lts. 34" inside dia. Jacketed	1 No.	45,000.00
2. Reaction kettle, stainless steel Cap. 500 lts. Jacketed	1 No.	25,000.00
3. Condensation-cum-storage tank (circulating cooling system) 5,000 litres	1 No.	5,000.00
4. Micro-Pulveriser, Micro heater high speed type, 3 HP, 50-75 kg/hr	1 No.	12,000.00
5. Hydro extractor stainless steel, Basket type 18" deep $\times$ 30" dia. complete with 5 HP motor	1 No.	15,000.00
6. Vacuum pump heavy duty type	2 Nos.	6,000.00
7. Distillation unit 30" $\times$ 4' ht. Jacketed, Cap. 600 ltrs complete with other accessories	1 No.	12,000.00
8. Boiler 180 kg/hr evaporation Cap. 100 PSI, complete with pump overhead tank, chimney pipes etc.		25,000.00
9. Dryer complete with 48 trays, 32" $\times$ 16" $\times$ 1-1/2		20,000.00

10. Misc. such as storage tanks, weighing scales, stirrer buckets, drums electric motors, vats, etc.	Rs.
	10,000.00
11. Chemical Laboratory—Testing equipment	15,000.00
	1,90.00
Electrification and Installation charges	19,000.00
Office equipment etc.	15,000.00
	2,24,000.00

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2. Working Capital (per month)

(i) Personnel

Administrative & Office

Office Superintendent	1	800.00
Accountant-cum-Cashier	1	600.00
Store-Keeper	1	500.00
Clerk-um-Typist	2	1,000.00
Peon-cum-Chowkidar	3	950.00

Technical

Technologist	1	1,200.00
Chemist-cum-Supervisors	3	2,400.00
Unskilled Workers	10	2,500.00

Perquisites @ 15% of Salaries 1,938.00

Say : 14,888.00
15,000.00

(ii) Raw Materials (per Month)

Item	Quantity	Rate per kg.	Value
		Rs.	Rs.
Xylene	770 kg.	6/-	4,620.00
OT Base	616 kg.	135/-	83,100.00
Aceto Acetic Ester	890 kg.	30/-	26,700.00
BON acid	440 kg.	50/-	22,000.00
Aniline oil	240 kg.	14/-	3,360.00
Phosphorous Trichloride	1370 kg.	10/-	13,700.00
Toluene	1400 kg.	6/-	8,400.00
Misc. chemicals such as Hydrochloric acid, Caustic soda, etc. and packing materials			7,000.00
			1,68,880.00
Say :			1,68,900.00

(iii) Utilities (per month)

Power—12,000 KWH @ 0.25 p.	3,000.00
Coal—15 tonnes @ 200/-	3,000.00
Water—500 KL	500.00
	6,500.00

(iv) Contingent expenses (per month)

	Rs.
Rent	2,500.00
Postage, Stationery, Telephone	500.00
Consumable stores	200.00
Maintenance & repairs	500.00
Transport charges	1,000.00
Advertisement & Publicity	2,000.00
Insurance etc.	1,500.00
	8,200.00

3. Total Capital outlay

	Rs.
Working Capital (3 months)	5,95,800.00
Fixed Capital	2,24,000.00
	8,19,800.00

4. Total Cost of Production (per year)

	Rs.
Total recurring expenses	23,83,200.00
Depreciation of machinery @ 10%	17,000.00
Depreciation on boiler and office equipment @ 20%	8,000.00
Interest on capital @ 15%	1,23,000.00
	24,21,800.00

5. Turnover per year

Item	Quantity	Rate per kg.	Value
		Rs.	Rs.
Naphthol ASG	12 tonnes	160/kg.	19,20,000.00
Naphthol AS	6 tons	130/kg	7,80,000.00
			27,00,000.00

6. Profit per year (Before taxation) 2,76,200.00

7. Return on investment 33.9 %

8. Break-even point 61 %

9. List of Suppliers of Raw Material

Xylene

1. M/s. Indian Petro-chemicals Ltd., BARODA.

2. M/s. Hindustan Steel Ltd.

OR Base

1. M/s. Amar Dye-chemicals Ltd., Rang Udyan, Sitladevi Temple, P. B. No. 6471, Mahim, BOMBAY.

2. Imported.

Aceto Acetic Ester

1. M/s. Colour Chem Ltd., Ravinder Annexe Dinshaw Vacha Road, Bombay-20.

2. M/s. Minu Chemicals, Vapi, 102 GIDC Industrial Estate, Dt. Balasad.

BON Acid

1. M/s. Atul Products Ltd.,
P. O. Atul,
Dt. Balsad.
2. M/s. Amar Dye Chem Ltd.,
Bombay.

Aniline Oil

1. M/s. Hindustan Organic Chemicals Ltd.
2. M/s. Dhanbad Chemicals,
Dhanbad.

Phosphorous Trichloride

1. M/s. Atul Products Ltd.,
P. O. Atul,
Dt. Balsad.
2. M/s. Excei Industries Ltd.,
184-187, Swamivivekanand Road,
Jogeshwari. Bombay.

Toluene

1. M/s. Hindustan Steel Ltd.,
Durgapur, Bhilai,
Rourkela.
2. M/s. F.C.I., Sindri,
Dt. Dhanbad.
3. M/s. TISCO,
Jamshedpur.

Hydrochloric Acid & Caustic Soda

1. M/s. Alkali & Chemical Corporation,
P. O. Rishra, Dt. Howrah,
West Bengal.
2. M/s. D.C.M. Chemicals,
New Delhi.
3. M/s. J. K. Chemicals.
M/s. Tata Chemicals.
M/s. Hindustan Heavy Chemicals etc.

List of Machinery Suppliers :

Reaction Kettles, tanks Dryers, Filter press etc. :

1. M/s. APV Engineering Co.,
2, Jessore Road,
Dum Dum, Calcutta.
2. M/s. Anup Engineering Ltd.,
Anil Starch Presises,
Anil Road,
Ahmedabad.
3. M/s. A. V. P. Ltd.,
Durgapur.
4. M/s. Vasant Industrial & Engg. Works,
470-471 Worli, Road,
Bombay-18.

Vaccum Pump

1. M/s. Kirloskar Bros.,
Kirloskar Vadi,
Dt. Sanghi.
2. M/s. K. G. Khosla & Co.,
New Delhi.

Boiler

1. M/s. Texmaco, Balgharoiyah,
Dit. 24, Parganas,
West Bengal.
2. M/s. Batlibouy & Co.,
Calcutta, Delhi, Bombay.
Also in Calcutta & Bombay.
3. M/s Wansons (Indi:) Pvt. Ltd.
22m N. Gaudhi Marg, Lajpat Nagar, IV
Delhi.

Hydro Extractor

1. M/s. Anup Engg. Ltd.,
Anil Road,
Ahmedabad.

(Reserved, item No. 214)

I. Introduction :

Nickel Formate is a green crystal soluble in water. It is used for manufacture of Nickel catalyst for hydrogenation of oil. It is sold in the form of a greenish powder in 50 Kgs. drums.

II. Technical Aspects

(a) Process outline

Nickel formate can be manufactured by three processes outlines below:—

- (i) Nickel virgin metal converted into nickel sulphate. According to the market potential for nickel sulphate and alternative market for nickel formate the unit can manufacture nickel sulphate only or in suitable proportions to suit the market pattern. Thus, in case the unit finds a good market for nickel formate only it can then go for complete production of nickel formate.

Nickel sulphate is almost titrated with sodium formate. Nickel formate has a sparing solubility as compared to sodium sulphate. Sodium sulphate is removed by fractional crystallisation and the lye containing sodium sulphate is drained of Nickel formate is crystallised out and is packed in polythene bags and sold in 50 kgs. drums.

- (ii) The alternative method for manufacture of nickel formate is by converting nickel into nickel chloride. Nickel chloride is then reacted with sodium formate to get nickel formate. Here again nickel formate and sodium chloride are separated by fractional crystallisation and packed as above.

- (iii) Nickel virgin metal can be converted into nickel carbonate which is then reacted with formic acid to get nickel formate. This process may be more costlier since the price of formic acid is more than the price of sodium formate.

(b) Quality Specifications (I.S.I./Inspection and quality control etc.)

Nickel formate contains 31% of nickel, it should be free from nitrate, ammonia, sodium formate, soda ash and other organic impurities such as Pentaerythritol etc.

(c) Production capacity (per annum)

(i) Quantity	Nickel formate	60 tons.
(ii) Value		Rs. 23,40,000-00

III. Financial Aspects

1. Fixed Capital

(i) Land & Building		Rs.	
Land	500 sq. metres	Rented	1,000/- p.m.
Built area office,			
Store	50 sq. metres		
Laboratory	50 sq. metres		
Working shed	200 sq. metres		
Total approximate cost (Land & Building)			1,000-00

(ii) Machinery & Equipments

(a) Production units :

Rs.			
1. Concentrated Sulphuric Acid Storage Tank M.S. 2 tons capacity	Indigenous.	One	2,000-00
2. Reaction Barrel 25' dia × 3' lined with polypropylene or lead—fitted with silica immersion heaters (two numbers)	"		8,000-00
Polypropylene sheets 3 mm thick or lead sheets 2 mm thick	"	two	8,000-00
3. Centrifuges for Nickel Sulphate 18" dia, lined with lead/FRP with 1.5 HP motor	"	One	8,000-00
4. Vacuum pump for filtration with filter SS Buchner funnel (with terylene cloth filters)	"	One	8,000-00
5. Sulphuric Acid transference pipes and stop cocks etc.	"	One	1,000-00
6. Centrifuge—S. S. Basket 18" dia—wity 1.5 H.P. motor	"	One	10,000-00

			Rs.
7. Nickel Formate concentration tank 4' x 4' x 2' with steam coils	Indigenous	Ten	15,000.00
8. Reactor— S. S. —jacketed with steam inlet/outlets— with stirrer (Motor 1 H.P.)	"	One	10,000.00
9. Micro Pulveriser — with 3 H.P. Motor	"	One	10,000.00
10. Baby Boiler—Oil fired Cap. 150 kgs per hours	"	One	20,000.00
11. Tray Dryer with heater elements, Air circulation 1.5 H.P. fan motor—with Tray 48 Nos. 2' x 4' x 3" (with extra trays) with hump control	"		15,000.00
12. Ion Exchange Columns (two cylinder) with water pump	"		6,000.00

(b) Testing Equipments

P.H. meter, Chemical balance, drying oven, Volumetric/gravimetric estimation equipment, glasswares etc. 15,000.00

(c) Electrification and installation charges @ 10% cost of the machine and equipments 12,800.00

Total 1,40,800.00

(iii) Cost of office equipment/working tables etc. 10,200.00
1,51,000.00

(2) Working Capital (per month)

(i) Personnel :

Designation	No.	Salary	Total
		Rs.	Rs.
(Administrative & Supervisory)			
1. Manager	1	1000/-	1,000.00
2. Clerk	1	500/-	500.00
3. Chowkidar	1	300/-	300.00
(Technical—skilled & Unskilled)			
1. Chemist (Production)	1	900/-	900.00
2. Skilled workers	2	400/-	800.00
3. Unskilled workers	5	300/-	1,500.00
(+) Perquisites @ 15% of salaries			750.00
Total			5,750.00
Say, Rs.			5,800.00

(ii) Raw Materials including Packing requirements (per month)

Particulars	Indigenous/ Imported	Qty.	Rate	Value
1	2	3	4	5
			Rs.	Rs.
Nickel Virgin	Imp.	1800 kgs.	60/per kgs.	1,08,000.00
Sulphuric Acid	Ind.	3.6 Tons	1,400 per ton	5,040.00
Nitric Acid 50% Strength	"	1.8 Tons	1,700/- per ton	3,060.00
Sodium formate	Imp/ Ind.	5.4 Tons	6500/- per ton	35,100.00
Packing material Drums	Ind.	100 Nos.	27/- per Drum	2,700.00
Polythene Bags	"			100.00
Total				1,54,000.00

(iii) Utilities (per month)

Power 100 KWH units @ 50 Paise per unit cost 50.00
Fuel furnace oil 5 tonnes @ Rs. 1,100/- per Ton 5,500.00
Total cost of utilities 5,550.00

(iv) Contingent expenses (per month)

Rent 1,000.00
Postage and Stationery 500.00
Consumable stores 300.00
Transport charges 100.00
Advertisement & Publicity 100.00
Sales expenses 150.00
Total 2,150.00

(v) Total Recurring Expenditure (per month)

Personnel 5,800.00
Raw-materials 1,54,000.00
Utilities 5,550.00
Contingent 2,150.00
Total 1,67,500.00

(vi) Total Working Capital on Months basis

Rs. 1,67,500.00 x 3 5,02,500.00
5,02,500.00

3. Total Capital Investment

(i) fixed Capital 1,51,000.00
(ii) Working Capital 5,02,500.00
Total (i) + (ii) 6,53,500.00

4. Cost of production (per year)

	Rs.
Total recurring cost per year	20,10,000.00
Depreciation on machinery & Equipment @10%	14,080.00
Depreciation on office equipment @ 20%	2,040.00
Interest on total investment @ 15%	98,025.00
Total cost of production	21,24,145.00

5. Turn-over (per year)

Item	ty.	Rate	Value
		Rs.	Rs.
Nickel Formate	60 Tons	39000 per ton	23,40,000.00
Total Turn-over			23,40,000.00

6. Profit per year (5=4) (before Income tax) 2,15,855.00

7. Rate of Return

$$\frac{\text{Net Profit per year} \times 100}{\text{Total Investment}} = 33\%$$

8. Break-even Point (%) of total production envisaged=40%

9. Addresses of Machinery & Equipment Suppliers

1. M/s. Jayems Engineering Co.,
130/132- Apollo Street,
Bombay-400023.
2. M/s. Madras Industrial Zining Ltd.,
25, Gilchrist Avenue,
Hawing Ton Road,
Madras-60003.
3. M/s. Dalco Engineering Pvt. Ltd.,
H. A. Ltd., compound,
Pimpri, Poona-411018.
4. M/s. Gohel Chemical Engineering Works,
Near Chakodiya Mahadev,
Rakhial, Ahmedabad-23.
5. M/s. Gopal Machine Tools,
L-111/112, GIDC Odhav,
Ahmedabad-382415.
6. M/s. Chemtex Engg. Enterprises,
L/17, GIDC, Odhav-382415.
7. M/s. Pharmalab Industries,
Star Metal Compound,
Lal Bahadur Shashtri Marg,
Vikhroli, Bombay.
8. M/s. D. Parikh Engineering Works,
115-Marol Industrial Estate,
Near Saki Naka,
Bombay-59.
9. M/s. India Equipment Corporation,
Andheri East, Bombay-93.
10. M/s. Gujarat Machinery Manufacturers Ltd.,
Churchgate Chambers,
32,34, Veer Nariman Road,
Bombay-23.

10. Addresses of Raw Material Suppliers

Packing Materials

1. M/s. Dimple Drums, Barrels (P) Ltd.,
Gulsunda Village,
Rassayam—Kolaba.
2. M/s. Rumi Plastics,
8-A, Indian Metal Forging & Rolling Mills compound,
L. B. Shashtri Marg,
Vikhroli,
West, Bombay-400083.

Sulphuric Acid

1. M/s. Tara Iron & Steel Co. Ltd.,
Jamshedpur.
2. M/s. The Dharamsi Morarji Chemical Co. Ltd.,
317-21, Prospect Chambers,
Dr. Dadabhoy Nauroji Road,
Fort, Bombay.
3. M/s. D. C. M. Chemical Works,
Post Box No. 1211,
Najafgarh Road, New Delhi.
4. M/s. Fertilisers & Chemical (Travancore) Ltd.,
Udyogmandal P. O.
Alwaye.
5. M/s. Bengal Chemical & Pharmaceutical Works Ltd,
94, Chittaranjan Avenue,
Calcutta.
6. M/s. J. K. Rayon,
Kamla Tower, Kanpur.
7. M/s. Indian Explosives Ltd.,
I. C. I. House,
34, Chowringhee, Calcutta.
8. M/s. The Dharamsi Morarji Chemical Co. Ltd.,
Kumhari (Madhya Pradesh).

Nitric Acid

1. M/s. Dharmsi Morarji Chemical Co. Ltd.,
372-21 Prospect Chambers,
Dr. Dadabhoy Nauroji, Road,
Fort, Bombay.
2. M/s. The D. C. M. Chemical Works,
Post Box No. 1211,
Najafgarh Road,
NEW DELHI.
3. M/s. The Cawnpore Chemical Works Ltd.,
Anwarganj, Post Box No. 27,
Kanpur.
4. M/s. Bengal Chemical & Pharmaceutical Works Ltd.
94, Chittaranjan Avenue,
Calcutta.
5. M/s. Indian Explosives Ltd.,
I. C. I. House 35,
Chowringhee, Calcutta.

Nickel Metal

Imported — canalised through M M T C.

Sodium Formate

Imported

Formic Acid

Imported

(Reserved item Sl. No. 268)

I. Introduction

Nickel Chloride & Nickel Sulphate are used in the electroplating baths for nickel plating. Nickel Carbonate finds its use as a correcting agent for adjustment of the pH of the bath. Nickel Sulphate is also used in the manufacture of Nickel Catalyst & other salts. It is also used as a mordant in dyeing and printing of textiles. Nickel salts are also used in Ceramics colours and glazes. The items are non-excisable.

II. Technical Aspects

(a) Process outline :

Nickel Sulphate $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$ is made by reacting Nickel metal with Sulphuric Acid. Nickel Pellets or flakes or biscuits are kept in a reaction vessel lined with lead or polypropylene, fitted with Silica Immersion Heaters. Sulphuric acid is added in excess with a little of Nitric acid and the reaction is allowed to continue at about 80°C . In a concentration tank, Nickel Sulphate is concentrated by heating in an open vessel. Liquour is allowed to cool. For better crystallisation, crystal seeding is done and the liquour is centrifuged.

Nickel Chloride $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$

Nickel Pellets are placed in acid resistant reactor and is treated with Hydrochloric acid. The liquour is heated with Silica Immersion Heater and the mixture maintained at about 80°C . At the completion of the reaction the pH is more than 3. The liquour is concentrated and sent to crystalliser. The crystals are separated by a centrifuge.

Nickel Carbonate $\text{NiCO}_3 \cdot 2\text{Ni}(\text{OH})_2 \cdot 4\text{H}_2\text{O}$

Nickel Sulphate liquour obtained as above is treated with Sodium Carbonate or preferably with Sodium Bicarbonate. Nickel Carbonate thus obtained is centrifuged and dried in a tray dryer. The dried lumps are then pulverised to a powdery form.

*Compounded Electroplating Salts for Nickel plating can also be manufactured in the same unit by mixing appropriately the different ingredients such as brightness, levellers etc. Only an additional suitable type of mixer would need to be provided.

(b) Quality Specifications (I.S.T.) :

Nickel Sulphate $\text{NiSO}_4 \cdot 7\text{H}_2\text{O}$	} IS No. 1 09-1969
Nickel chloride $\text{NiCl}_2 \cdot 6\text{H}_2\text{O}$	
Nickel Carbonate corresponding approximately to formula	
$\text{NiCO}_3 \cdot 2\text{Ni}(\text{OH})_2 \cdot 4\text{H}_2\text{O}$	

(c) Production Capacity (Per annum)

	Nickel Sulphate	Nickel Chloride	Nickel Carbonate	Total
(i) Quantity	12 Tons	6 Tons	6 Tons	24 Tons
(ii) Value	Rs. 3,00,000	Rs. 1,80,000	Rs. 3,00,000	Rs. 7,80,000

III. Financial Aspects

1. Fixed Capital :

(i) Land and Building :

	Rs.
Land 300 sq. meters	7,500.00
Built area Office, Stores etc. . . 50 sq. meters	25,000.00
Working shed 150 sq. meters	45,000.00
Total approximate cost (Land & Building)	77,500.00

(ii) Machinery and Equipment :

(a) Production units :

Sl. No.	Description	Indigenous/ Imported	Qty.	Price Rs.
1.	Sulphuric Acid Storage Vessel capacity 200 kg.	Indigenous	One	1,000.00
2.	Nitric Acid Storage vessel Capacity 100 kg.	"	One	1,000.00
3.	Hydrochloric Acid Storage Vessel Capacity 200 kg.	"	One	1,000.00
4.	Reaction Barrel—25' Dia × 3' Lined with Polypropylene fitted with Silica Immersion heaters (Two Numbers) (Polypropylene sheets 3 mm thick for making barrel) in the middle of the barrel	"	Two Nos.	6,000.00
5.	Centrifuge—Basket approx. 18" Dia, lined with lead/FRP—with 1.5 H.P. motor	"	One	7,000.00
6.	Dryer for Nickel Carbonate—Trays 2'3"—20 Nos. with heater elements and blower—(0.5 H. P.) with 1 hemp control.	"	One	6,000.00

7. Pulveriser (Small) with rotating disc 10" dia, with 0.5 H. P. Motor for Nickel Carbonate	Indigenous	One	8,000.00
8. Vacuum Pump for filtration with filter funnel (Buchner Type) S.S.	"	One	8,000.00
9. Acid Transfer Pipes and stop cocks attached to individual acid storage tanks	"	Three	2,000.00
10. Weighing Balance	"	One	1,500.00
11. Ion Exchange columns (Two Cylinders) with Water Pump	"	One	6,000.00
(b) Testing equipments : pH meter, weighing balance, drying oven, volumetric/Gravimetric estimations equipment.			15,000.00
(c) Electrification & Installation charges @ 10% cost of the machine and equipment			6,250.00
Total cost of machinery & equipment etc.			68,750.00
(iii) Cost of office equipment/working tables etc.			15,250.00
(iv) Pre-operative expenses (project cost Non-refundable deposits) if any			6,000.00
Total fixed capital (i), (ii), (iii) & (iv)			1,67,500.00

(i) Personnel

Designation	No.	Salary	Total (Rs.)
(a) Administrative and Supervisory			
Manager	1	1,000.00	1,000.00
Chemist (Analyst)	1	800.00	800.00
Clerk	1	500.00	500.00
(b) Technical—Skilled and unskilled :			
Chemist (Production)	1	800.00	800.00
Workers—Skilled	2	400.00	800.00
Workers—Unskilled	2	300.00	600.00
Total (Salaries)			4,500.00
(+) Perquisites			450.00
Total			4,950.00
Say			5,000.00

2. Working Capital (per month)

(II) Raw materials requirements (per month)

Particulars	Indige-nous/ Imported	Qty.	Rate	Value Rs.
(For production of Nickel Sulphate 1 Ton per month, Nickel Chloride 0.5 tons per month and Ni Carbonate 0.5 ton per month).				
Nickel	Imported through MMTC	590 Kgs.	@ Rs. 67 per kg.	39,530.00
Sulphuric Acid (Sp. Gr. 1.484)	Indige-nous	700 Kgs.	@ 1350 per ton.	945.00
Nitric Acid Sp. Gr. 1-4	"	200 Kgs.	@ 1700/- per ton.	340.00

Hydrochloric Acid Sp. Gr. 1.1	Indig - nous	1 Ton	@ 600 per ton	Rs. 600.00
Sodium Bi Carbonate	"	500 Kgs.	@ 2500 per tons	1,250.00
Packing Materials :				
50 Kgs. drums @ 16 each—50 Nos.				800.00
5 Kgs. PVC Bottles @ Rs. 7/- each—100 Nos.				700.00
25 Kgs. capacity Jute Bags @ Rs. 4 each—100 Nos.				400.00
Polythene Bags				435.00
Total cost of raw materials				45,000.00

(iii) Utilities (per month)

Power 200 KWH units @ 50 P. per unit	Cost (Rs.) 100.00
Total cost of utilities	100.00

(iv) Other contingent expenses (per month)

Postage & Stationery	200.00
Telephone	200.00
Consumable stores	400.00
Repairs & Maintenance	2,000.00
Transport Charges	300.00
Advertisement & Publicity	1,000.00
Insurance	200.00
Taxes	300.00
Sales expenses	300.00

4,900.00

(v) Total Recurring Expenditure (per month)

Staff	5,000.00
Raw material	45,000.00
Utilities	100.00
Contingent Expenses	4,900.00
Total	55,000.00

(vi) Total working capital (on 3 months basis)

1,65,000.00

3. Total Capital Investment

(i) Fixed Capital	1,67,500.00
(ii) Working Capital	1,65,000.00

Total capital investment 3,32,500.00

4. Cost of Production (Per year)

Total recurring cost per year	6,60,000.00
Depreciation on building (if any) @ 5% on Rs. 70,000/-	3,500.00
Depreciation on machinery and equipment and testing equipment @ 20% (since corrosive acids are involved in Processing)	13,700.00
Depreciation on office equipment @ 20%	3,000.00
Interest on total investment @ 15%	49,800.00
Total Cost of Production	7,30,000.00

5. Turn-over (per year)

Item	Qty.	Rate including packing material (Per ton)	Value (Rs.)
Nickel Sulphate . . .	12 Tons	25,000	3,00,000.00
Nickel Chloride . . .	6 Tons	30,000	1,80,000.00
Nickel Carbonate . . .	6 Tons	50,000	3,00,000.00
Total Turn-over . . .			7,80,000.00

6. Profit per year (5—4)
(before Income-Tax) . . . 50,000.00

7. Rate of Return : . . . 15%

8. Break-even point—70%.

9. Addresses of Machinery and Equipment Suppliers

- (1) Indian Equipment Corporation, Andheri East, Bombay-93.
- (2) Garcem Engineers, 176, GIDC Estate, Naroda, Ahmedabad.
- (3) Gopal Machine Tools, 1MN-2-GIDC Industrial Estate, Odhav, Ahmedabad-382415.
- (4) M. A. Engg. Corporation, 1-3, Universal Compound, Old Nagardas Road, Andheri (E), Bombay-59.
- (5) Amul Engineering, 88/6, G.I.D.C. Estate, Vatva, Ahmedabad-382445.
- (6) Tempo Industrial Corporation, 1 Lamington Chambers, 394 Dr. Bhadkhamkar Marg, Bombay-400004.
- (7) Gujarat Machinery Manufacturers Ltd., Churchgate Chambers, 32/34 Veer Nariman Road, Bombay-400023.

10. Addresses of Raw Material Suppliers

Raw Materials (Packing Materials)

- (1) Dimple Drums & Barrels (P) Ltd., Gulsunda Village, Rassayam-Kolaba.
- (3) Rumi Plastics, 8-A, Indian Metal Forging & Rolling Mills Compound, L. B. Shastri Marg, Vikhroli-West, Bombay-400083.

Acid Hydrochloric

- (1) M/s. Dharamsi Morarji Chemical Co. Ltd., 317-21, Prospect Chambers, Dr. Dadabhoy Nauroji Road, Fort, Bombay.
- (2) M/s. J. K. Chemicals Ltd., J. K. Building, Dougall Road, Ballard Estate, Bombay.
- (3) M/s. D. C. M. Chemical Works, Post Box No. 1211, Najafgarh Road, New Delhi.

(4) M/s. Modern Chemical Industries, G. T. Road, Delhi-Shahdara.

(5) M/s. Mettur Chemical & Industrial Corporation Ltd., Mettur Dam, R. S. (Salem Distt.).

(6) M/s. The Cawnpore Chemical Works Ltd., Kanhan, Post Kamptee, (Madhya Pradesh).

(7) M/s. Tata Chemicals Ltd., Mithapur, Okhamandal (Saurashtra).

Acid Nitric

(1) M/s. Dharamsi Morarji Chemical Co. Ltd., 317-21, Prospect Chambers, Dr. Dadabhoy Nauroji Road, Fort, Bombay.

(2) M/s. The D.C.M. Chemical Works, Post Box No. 1211, Najafgarh Road, New Delhi.

(3) M/s. The Cawnpore Chemical Works Ltd., Anwarganj, Post Box No. 27, Kanpur.

(4) M/s. Bengal Chemical & Pharmaceutical Works Ltd., 94-Chittaranjan Avenue, Calcutta.

(5) M/s. Indian Explosives Ltd., I.C.I., House, 35, Chowringhee, Calcutta.

Acid Sulphuric

(1) M/s. Tata Iron & Steel Co. Ltd., Jamshedpur.

(2) M/s. The Dharamsi Morarji Chemical Co. Ltd., 317-21, Prospect Chambers, Dr. Dadabhoy Nauroji Road, Fort, Bombay.

(3) M/s. The D.C.M. Chemical Works, Post Box No. 1211, Najafgarh Road, New Delhi.

(4) M/s. Fertilisers & Chemicals (Travancore) Ltd., Udoygmandal P. O., Alwaye.

(5) M/s. Bengal Chemical & Pharmaceutical Works Ltd., 94-Chittaranjan Avenue, Calcutta.

(6) M/s. J. K. Rayon, Kamla Tower, Kanpur.

(7) M/s. Indian Explosives Ltd., I.C.I. House, 34, Chowringhee, Calcutta.

(8) M/s. The Dharamsi Morarji Chemical Co. Ltd., Kumhari (Madhya Pradesh).

Nickel

Imported and canalised through M.M.T.C.—Minerals & Metals Trading Corporation (Indian Express Building, New Delhi).

Sodium Bicarbonate

(1) M/s. Tata Chemicals Ltd., P. O. Mithapur Okhamandal (Gujarat).

(2) M/s. Dhrangadhra Chemical Works Ltd., Dhrangadhra (Gujarat).

(Reserved items Sl. Nos. 265, 266, 267 & part of 289).

I. Introduction

Naturally occurring essential oils cover a large number of volatile oils present in the plant kingdom. The oils may be present in the flowers, fruits, leaves, bark, wood or roots of the plants. Many of the oils are of economic importance as they find ready use in medicine, perfumery and cosmetics. Some oils like Sandalwood Oil, Geranium Oil, Palmarosa oil, Lemongrass Oil, Eucalyptus oil etc. which are of economic importance have already found place separately under the reserved list of items for small scale sector. It is, therefore, inferred that other important oils of Indian origin like Vetivert Oil (*Vetiveria Zizanioides*), Citronella Oil (*Cymbopogon Winterianus*) which have ready internal and export demand come under this category of other Natural Essential Oils. For purposes of this scheme, distillation of Vetivert Oil is taken into account. The process and equipment for steam distillation are the same for almost all the oils.

Essential oil industry is purely agrobased. Whenever the plants are cultivated, the material to be distilled are available from the agriculturists at reasonable price. The price of vetivert roots per tonne is about Rs. 3,500/- per tonne.

II. Technical Aspects

(i) Process Outline

The process briefly consists of charging the distillation still with vetivert roots in batches of 500 Kgs/day and distilling the same with steam at about 15 lbs. pressure generated in a boiler. The oil vapour and steam are condensed in the condensor and collected. The oil is subsequently separated from water and packed in suitable containers. Distillation takes about 16 to 18 hrs. and the yield varies from 1.0 to 1.5% (Average 1.25%).

(ii) Quality Specifications

There is an I.S. Specification for Vetivert Oil—I. S. 1177/1969.

(iii) Production Capacity (Per annum)

(a) Quantity :

Distillation of 150 M.T. of Vetivert Roots to obtain 1875.00 Kgs. of oil @ 1.25% yield.

(b) Value :

1875 Kgs. @ Rs. 475/kg. = Rs. 8,90,625/-.

(iv) Motive Power :

5 H.P. only for overhead water pump including lighting.

III. Financial Aspects

1. Fixed Capital

(i) Land and Building :

	Rs.
Land—1000 sq. meters @ Rs. 15/-	15,000.00
Built area office, stores etc.—100 sq. m. @ Rs. 400/-	40,000.00
Working shed—150 sq. m. @ Rs. 250/-	37,500.00
Total approximate cost (Land and Building)	92,500.00

(ii) Machinery and Equipment :

(a) Production Unit :

Sl. No.	Description	Ind./ Imp.	Qty.	Price Rs.
	See separate sheet	Ind.	—	1,37,300.00
(b)	Testing equipment			
	Laboratory glass equipments, Chemical balance etc.			2,500.00
(c)	Electrification & installation charges @ 10% of cost of machine and equipment			13,980.00
	Total cost of machinery & equipment etc.			1,53,780.00
(iii)	Cost of moulds/other fixtures			—
(iv)	Cost of office equipment/working tables			5,000.00
(v)	Pre-operative expenses (project cost non-refundable deposits) if any			5,000.00
	Total Fixed Capital (i), (ii), (iii) (iv) & (v)			2,56,280.00

2. Working Capital (per month)

(i) Personnel

Designation	No.	Salary Rs.	Total Rs.
(Administrative and Supervisory)			
Chemist	1	850.00	850.00
Manager-cum-Accountant	1	750.00	750.00
Clerk-cum-Typist	1	350.00	350.00
Peon/Watchman	2	200.00	400.00

(Technical—Skilled and unskilled)

			Rs.
Boiler Attendant	1	300.00	300.00
Skilled workers	3	300.00	900.00
Unskilled workers	8	200.00	1,600.00
Total			5,150.00
(+) Prerequisites @ 15% of the salary			773.00
Total			5,923.00

(ii) Raw materials including packaging requirements (per month)

Particulars	Ind./ Imp.	Qty.	Rate Rs.	Value Rs.
Vetivert roots	Ind.	12.5 T	3,500.00	43,750.00
Packing materials	„	L.S.		1,400.00
Total cost of raw materials				45,150.00

(iii) Utilities (per month)

Power 2250 KWH units @ 0.15 per unit			337.50
Fuel—steam/furnace oil, 4 tonnes @ Rs. 1250/- ton			5,000.00
Water—250 kilolitres @ Rs. 2/- per KL			500.00
Total cost of utilities			5,837.50

(iv) Other contingent expenses (per month)

Rent			—
Postage & stationery	L.S.		100.00
Telephone	„		200.00
Consumable stores	„		1,500.00
Repairs & Maintenance	„		250.00
Transport charges	„		500.00
Advertisement & publicity	„		500.00
Insurance	„		125.00
Taxes	„		100.00
Sales expenses	„		500.00
Misc. expenditure	„		250.00
			4,025.00

(v) Total Recurring Expenditure (per month) 60,935.50

(vi) Total working capital (for 3 months) 1,82,806.50

3. (i) Fixed capital 2,56,280.00

(ii) Working capital 1,82,806.00

or 4,39,086.50
4,39,000.00

4. Cost of Production (per year)

	Rs.
Total recurring cost per year	7,31,226.00
Depreciation on building @ 5%	3,875.00
Depreciation on machinery & Equipment @ 10%	15,378.00
Depreciation on furnaces @ (20-30%)	—
Depreciation on moulds & fixtures	—
Depreciation on office equipment @ 20%	1,000.00
Interest on total investment @ 15%	65,850.00
Total cost of production	8,17,329.00

5. Turnover (per year)

Item	Qty.	Rate Rs.	Value Rs.
Vetivert oil	1875 Kg.	475/- kg.	8,90,625.00
Total turnover			8,90,625.00

6. Net profit per year (5—4) 8,90,625—
8,17,329 (before income-tax) 73,296.00

7. Net profit Ratio = N.P. per year × 100/
TO per year 8.2

8. Rate of Return = N.P. per year × 100 / Total Invt. = 16.6

9. Break-even Point (% of total production envisaged)

(i) Fixed Cost Rs.

(a) Depreciation on m/c. equipment, tools & fixtures & office equipment	16,378.00
(b) Rent or Depreciation on building	3,875.00
(c) Interest on Total investment	65,850.00
(d) Insurance	1,500.00
(e) 40% of salary & wages	28,430.00
(f) 40% of other contingent expenses	18,720.00
Total Fixed Cost	1,34,753.00

(ii) Net Profit per year (as at S. No. 6)

$$\text{B.E.P. \%} = \frac{\text{FC} \times 100}{\text{FC} + \text{P}} = \frac{134753 \times 100}{134753 + 73296} = 64.7\%$$

Where F.C. = Total Fixed Cost
P = Net profit per year.

10. Additional Information**11. Addresses of Machinery and Equipment Suppliers****Boiler**

1. M/s. Batliboi & Co., M. G. Road, Ernakulam.

2. M/s. Jaya & Co., Trichy Road, Coimbatore.

Distillation Still :

1. M/s. Andhra Scientific Co., Mount Road, Madras-2.

2. M/s. Mookkens Engg. Industries, Puthole, Trichur-4.

3. M/s. Kerala Engg. Corp., National Highway, Angamalli, Kerala.

12. Addresses of raw material suppliers :
Locally available from cultivators.

List of Machinery and Equipment

S. No.	Description	Qty.	Value Rs.
1	2	3	4
1.	Vashpa Vertical Oil fired team generator—Model LB-8 complete 454/568 Kgs./hour 1000/1250 lbs./hour	1	37,020.00
2.	Oil fired unit for the above	1	4,005.00
3.	Stills made out of copper sheet 18 Swg with false bottom, goose-neck, charging and discharging holes, steam pipes etc. 500 kg. capacity	2	60,000.00

1	2	3	4
4.	Multi tube condensor made out of S. S. tubes with copper outer shell	3	30,000.00
5.	Platform weighing balance	1	1,700.00
6.	Counter Pan Balance—25 lbs. capacity	1	900.00
7.	5. H. P. motor with pumps for water supply	1	3,670.00
			1,37,295.00
	or Say		1 37,300.00
(Reserved item Sl. No. 226)			



I. Introduction

Optical whitening agents are water soluble dyestuffs. These bleaching agents are a type of fluorescent dyes which create an illusion of whiteness. Ultramarine blue which is also used to get an extra whiteable finish on white cotton textiles absorb visible light while these bleaching agents absorb the ultra-violet rays from the day light and remit a part of the same to a direction to produce visibility of light and thus enhance the bright appearance of white textiles.

Due to this unique property, optical bleaching agents find extensive use in textile industry, paper mills and also in house-hold applications.

At present there are four large units as against 12 small units engaged in the production of optical whitening agents. The capacity installed in the organised sector is 633 tons while the production in 1973 was 752 tonnes as against the yearly estimated production by small units is around 300 tons. The detailed year-wise breakup of demand of this product that was anticipated are tabulated below to provide an idea about the demand prospect of this product.

	Quantity in tonne			
	1976	1977	1978	1979
Demand	1179	1296	1425	1567
Export target	235	282	338	405

The product is being marketed in a number of trade names, the most dominant brand being 'RANIPAL' (previous brand-TINOPAL).

II. Technical Aspects

(a) Process Outline

Manufacture of Optical bleaching agent is a single stage reaction between Diamino Stil benedi Sulphonic acid and Cyanuric chloride. The product is sold in different shades and most common shades are blue and red.

(i) Fluish optical whitening agents

The reaction is carried out between 7 Kgs of DASBDSA, 7 Kgs of NH_3 (or Metanillic acid), 7 Kgs. of Cyanuric chloride and 10 Kgs. of Soda ash. Required quantity of Diethanol Amine is added to this solution. The temperature is maintained

at about 25°C-30°C for two hours. Salt is added to precipitate the optical bleaching agent.

(ii) Reddish optical bleaching agent

Reaction is carried out between 15 Kgs. Diamino-Stilbene Disuphonic acid and 11 Kgs. Phenyl Isocyanate and 4.5 Kgs of Soda ash at room temperature for 12 hours. The solution is then heated to about 80°C, cooled to obtain crystals of reddish optical whitening agents.

Both the products (whitish and reddish) are then dried and grinded.

(b) There is no Indian Standard at present for optical whitenings agent. The manufacturers may, therefore, make it as per buyers specifications. It is, however, desirable that the product is sold with minimum 15%-20% active ingredient.

(c) Production Capacity

Item	Quantity	Value (Rs.)
Optical whitening agents for cotton textiles	10 tons	10,80,000.00

III. Financial Aspects

(1) Fixed Capital

(i) Land and Building

Land—125 sq. mt.		
Built area, Office stores & work shed (Rented)	300 sq. m.	2,500.00 (p. m.)

(ii) Machinery and equipment

(1) Production units

1. Reaction vessels SS capacity 2000 lts. Cap. with SS stirrer & 1/4 HP motor—4 Nos.		1,00,000.00
2. Filter press 24" x 24"	2 Nos.	25,000.00
3. Tray drier, steam heated with 24 aluminium trays	1 No.	20,000.00
4. Micro Pulveriser with motor	1 No.	10,000.00
5. Baby boiler complete with Pump set and Chimney	1 No.	12,000.00
6. Miscellaneous equipment like slurry pump, platform, scale, wooden vats, tanks etc.		10,000.00

1,77,000.00

Electrification & Installation charges	Rs. 18,000·00
Laboratory equipment	10,000·00
	2,05,000·00
(b) Office equipment, working tables etc.	15,000·00
	2,20,000·00

(b) Working Capital per month

(i) Personnel

<i>Admn. and Supervisory</i>	Rs.
Sales Manager One	1,000·00
Accountant-cum-Cashier One	800·00
Clerk-cum-typist two	1,000·00
Store Keeper One	500·00
Peon One	200·00
<i>Technical</i>	
Chief Chemist One	1,000·00
Assistant Chemist one	700·00
Supervisor one	700·00
Labourers (skilled unskilled) ten	3,500·00
Chowkidar one	300·00
	9,700·00
Perquisites @ 15% of salary	1,500·00
	11,200·00

(ii) Raw Material (per month)

1. Diamino Stilbene Disulphonic Acid 350 Kgs.	11,000·00
2. Cyanuric chloride 350 Kgs.	8,400·00
3. Soda ash 500 Kgs.	700·00
4. Ammonia 350 kgs.	1,200·00
5. Diethanol Amine 500 Kgs.	10,600·00
6. Common salt & Miscellaneous chemicals	1,700·00
7. Packing materials	1,500·00
	55,100·00

(iii) Utilities (per month)

	Rs.
Power 4,000 KWH @ 0·25	1,000·00
Fuel (coal) @ 200/-	2,000·00
Water 200 KL	200·00
	3,200·00

(iv) Contingent Expenses (per month)

Rent	2,500·00
Postal, Telephone & Stationery	500·00
Ice and other consumables	500·00
Repairs and maintenance	200·00
Advertisement & Publicity	1,600·00
Insurance	400·00
	5,100·00

(v) Total Working Capital (3 months)	Rs. 2,23,800·00
3. Total capital investment	4,43,800·00

4. Cost of Production (per year)

Recurring cost per year	8,95,200·00
Depreciation on M/c. @ 10%	22,000·00
Interest on capital @ 15%	66,500·00
	9,83,700·00

5. Turnover per year

Optical whitening agents—18 tonnes	Rs. 10,80,000·00
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6. Profit per year (before taxation) 96,300·00

7. Rate of return 22% (Approx.)

8. B.E.P. 67%

9. List of suppliers of Raw Materials

1. Cyanuric chloride—Imported.
2. Diamino Stilbene Disulphonic acid.
 1. M/s. Atul Products,
P. O. Atul, Balasad, Gujarat.
 2. M/s. Azofun (P) Ltd.,
61 Apollo St. Bombay.
 3. M/s. Aniline Dyestuffs & Chemicals
Mahalaxmi Chamber, 2nd floor,
22 Balandkhai Desai Road, Bombay-26.

3. Soda Ash

1. M/s. Tata Chemicals,
Mithapur, Maharashtra.
2. M/s. Dharangadhra Chemicals
Dharangadhara, Gujarat.

4. Di Ethanol Amine—Imported.

5. Ammonia

1. M/s. Coromandal Fertilisers Co.
Visakhapatnam, A.P.
2. M/s. Fertiliser Corporation of India.

10. List of machinery suppliers

1. Reaction Vessels & tanks, dryers, filter press
 1. M/s. K. Mahadev & Co., Bombay.
 2. M/s. APV Engg. Co. Ltd., 2 Jessore Road,
Dumdum.
 3. M/s. Anup Engg. Ltd., Anil Starch Premises,
Anil Road, Ahmedabad.
 4. M/s. Vasant Industrial & Engg. Works,
470-471 Worli Road, Bombay.

2. Boiler

1. M/s. Texmaco, Belghoria Distt.
24 Parganas, West Bengal.
2. M/s. Batlibouy & Co.
Delhi, Bombay & Calcutta.

(Reserved item Sl. No. 212)

PAINT DRIERS—LEAD NAPHTHENATE &
COBALT NAPHTHENATE ETC.

I. Introduction

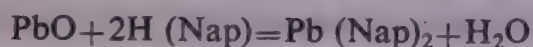
Paint driers include naphthenates Octoates, Linoleates etc. of lead, cobalt, manganese, zinc and calcium. Incorporation of paint driers quickens the drying of paint films. A combination of driers is quite often necessary to induce the desired drying/film forming characteristics. All the types of paint driers are presently being manufactured, use of naphthenates and octoates being most common. The present scheme is illustrative of the manufacture of paint driers and is based on the manufacture of lead and cobalt naphthenates.

II. Technical Aspects

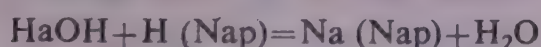
(a) Process Outline

The metallic naphthenates are manufactured by either Fusion process or Double Decomposition process.

In fusion process, a metal oxide is reacted directly with naphthenic acid to produce the naphthenates and water. For example,



In the Double Decomposition Process, naphthenic acid is first neutralised with NaOH to form soap.



After neutralisation, a solution of salt of the required metal is added and double decomposition takes place. The strength and viscosity are adjusted with the addition of white spirit.

(b) Quality Specifications

IS 385--1962--Liquid driers, concentrated, for paints.

IS 386--1962--Liquid driers for paints.

(c) Production capacity (per annum)

(a) Quantity—

(i) Lead Naphthenates 30 MT

(ii) Cobalt Naphthenates 30 MT

(b) Value—

	Rs.
(i) Lead Naphthenates	6,00,000·00
(ii) Cobalt Naphthenates	12,00,000·00
	18,00,000·00

III. Financial Aspects

(a) Fixed Capital

(i) Land and Building :

Land—150 sq. metre.

Built area Office, Stores etc. 50 sq. mt.

Work Shed

} Rs. 60,000·00

(ii) Machinery and equipment

Sl. No.	Description	Qty.	Price (Rs.)
1.	S. S. Reactor with mechanical stirrer, M. S. Jacket, Heating arrangement, 1000 lits. cap.	1	20,000·00
2.	S. S. Reactor without stirrer and heating arrangement, 1000 lits. cap.	1	14,000·00
3.	M. S. heating kettle, (coal fired) 500 lits. capacity	2	10,000·00
4.	S. S. Thinning vessel with stirrer etc. 1000 litre capacity	1	15,000·00

59,000·00

Testing equipments :

3,000·00

62,000·00

Electrification & Installation charges @ 10% of cost of machines & equipment

6,000·00

Cost of moulds/other fixtures

4,000·00

Cost of office equipments/working tables etc.

3,000·00

Total cost of machinery & equipment etc.

75,000·00

Total fixed capital=(i)+(ii)=Rs. 60,000+ 75,000
=Rs. 1,35,000·00

(b) Working Capital (per month)

(i) Personnel

Designation	No.	Salary Rs.	Total Rs.
(Administrative & Supervisory)			
Manager/Supervisor	1	600·00	600·00
Chemist	1	500·00	500·00
Clerk/Accountant	1	250·00	250·00
Watchman/Peon	2	125·00	250·00
Technical Staff (Skilled and Unskilled)			
Skilled Labour	2	250·00	500·00
Unskilled Labour	4	175·00	700·00
Total			2,800·00
Perquisites @ 15% of salaries			400·00
			3,200·00

(ii) Raw Materials

Particulars	Indi- genous/ Import- ed	Qty.	Rate Rs.	Value Rs.
(a) For Lead Naphthenate				
Litharge	Indi- genous	840 kg.	11/- per kg.	9,240·00
Naphthenic Acid	"	1680 kg.	12·50 per kg.	21,000·00
(b) For Cobalt Naphthenates				
Naphthenic Acid	"	1150 kg.	12·50	14,375·00
Cobalt Sulphate	"	1400 kg.	55·00	77,000·00
Caustic Soda	"	200 kg.	2·50	500·00
(c) Packaging				2,000·00
Total cost of raw-materials				1,24,115·00

(iii) Utilities (per month) :

Utilities (per month) :	Cost (Rs.)
Power	200·00
Fuel (Coal) 1 tonne @ Rs. 200/- per ton.	200·00
Total cost of utilities	400·00

(iv) Other contingent expenses (per month)

<i>) Other contingent expenses (per month)</i>	<i>Rs.</i>
Postage & Stationery	500·00
Telephone	100·00
Consumable Stores	200·00
Repairs & Maintenance	200·00
Transport charges	200·00
Advertisement publicity	700·00
	1,900·00

(v) Total working capital (on three month basis)

(v) Total working capital (basis)	3,89,000·00 (Say)
(c) Total Capital Investment	5,24,000·00
(d) Cost of Production (per year)	
Total recurring cost per year	15,56,000·00
Dep. on machinery & Equipment @ 10%	7,500·00
Interest on total investment @ 15%	78,600·00
Total cost of production	16,42,100·00

(e) Turn over per year

Item	Qty.	Rate	Value
Lead Naphthenates	30 M.T.	Rs. 20,000/- per M.T.	6,00,000·00
Cobalt Naphthenates	30 M.T.	40,000/- per M.T.	12,00,000·00
			18,00,000·00

(f) Net Profit per year Rs. 1,58,000·00 (Say).

(g) Rate of return—on capital investment — 34%

(h) Break even point 52%

Suppliers of raw materials

1. Associated Pigments Ltd.
14, Netaji Subhash Road, Calcutta.
2. Waldies Ltd.,
A-1, Gillander House,
Netaji Subhash Road, Calcutta.
3. Murarka Paint & Varnish Works Ltd.
5-E, Dalhousie Square,
Calcutta.

Suppliers of Machinery and equipment

(Local fabricators of plant and equipment)

(Reserved item Sl. No. 241).

PAPER BOARD CARTONS

I. Introduction

Paper Board Cartons are an effective medium for packaging small items such as automobile parts, pharmaceuticals products, plastic products, rubber components, glass items etc. Due to the rapid industrialisation in India during the last few years, the demand for paper board cartons is increasing day by day. It has the advantage of light weight, easy to fabricate, easy for storing, keeps the articles dust free after sealing and has the added advantage of attractive printing, thus making the item packed to be more eye appealing for sales.

II. Technical Aspects

(i) Process Outline

Paper board is first printed on the printing machine as per requirements. These are then die punched to the required size on the cutting and Creasing Machine. There are then creased, folded, glued if required to give it final shape.

(ii) Quality Specifications:

As per customer's requirements.

(iii) Production Capacity (per annum)

(a) Quantity 60 lakhs cartons (size 15 cms×7.5 cms×5 cms)

(b) Value : Rs. 15,00,000

(iv) Motive Power : 30 H. P.

III. Financial Aspects

(i) Land & Building:

land

Built area	
Office Stores etc.	50 sq. metres
Working Shed.	150 sq. metres (Rented)

(ii) Machinery & Equipments:

(a) Production unit

	Rs.
1. Mercedes Automation Stop Cylinder letterpress machine size 18" × 23" 1	95,000.00
2. Printing Machine—Platen 10" × 15" 1	10,000.00
3. Cutting and Creasing Machine 20" × 26" 1	35,000.00
4. Paper cutting Machine 42" 1	5,000.00
5. Dab press, proof press, types etc. 1	3,000.00

(b) Testing Equipment Physical balance, Metre Scale etc.	Rs. 1,000.00
(c) Electrification and installation charges.	15,000.00
(iii) Cost of Dies, Moulds etc.	5,000.00
(iv) Cost of office equipments working table etc.	6,000.00
	1,75,000.00

Working Capital (per month):

(i) Personnel:

Administrative & Supervisory

		Rx.
Manager 1	800	800
Salesman 1	500	500.00
Clerk-cum-typist 1	350	350.00
Peon 1	200	200.00
<i>Technical</i>		
Skilled Workers 6	400	2,400.00
Unskilled workers 6	300	1,800.00
		6,050.00
Perquisites @ 15% of the salaries		950.00
		7,000.00

(ii) Raw Materials:

Board, Papers, Inks, Glue etc. L.S. 89,000.00

(iii) Utilities:

	Rs.
Power 6000 KWH @ 0/30 p unit	1,800.00
Water, Fuel etc.	200.00
	2,000.00

(iv) Other Contingent expenses

	Rs.
Rent	1,500.00
Postage & Stationery telephone etc.	250.00
Consumable Stores	200
Repairs & Maintenance	150.00
Transport charges	500.00
Advertisement & Publicity	500.00
Sales Expenses	500.00
Miscellaneous Expenditure	250.00
	4,000.00

(V) Total recurring Expenditure (per month)

	Rs.
Personnel	7,000.00
Raw Materials	89,000.00
Utilities	2,000.00
Contingent Expenditure	4,000.00
	1,02,000.00
(vi) Working Capital (3 months)	30,06,000.00
(vii) Total Capital Investment	
(i) Fixed Capital	1,75,000.00
(ii) Working Capital	3,06,000.00
	4,91,000.00

4. Cost of Production (Per year)

	Rs.
Total recurring cost per year.	12,24,000
Depreciation on Machinery & Equipments @ 10%	16,000.00
Depreciation on Dies, Testing equipment types, etc. @ 25%	2,250.00
Depreciation on office equipment @ 20%	1,200.00
Interest on Capital Investment @ 15%	72,050.00
	13,15,500.00

5. Turn Over (per year)

By sale of 50 lakhs cartons @ Rs. 250/- per thousand	15,00,000.00
6. Net Profit per year (5-4)	1,85,500.00
7. Net Profit ratio	12.3%
8. Rate of return	38.5%
9. B.E.P.	54.0%

Address of Machinery & Equipment

1. M/s. Printer's House (P) Ltd.
10, Scindia House, Con. Place, New Delhi-110001.
2. M/s. Indo Europe Trading Co. Pvt. Ltd.
Bhupen Chambers, 9, Dalal Street, Fort, Bombay-400023
3. M/s. Manubhai Sons & Co.
Manu Mansions, 16, Shaid Bhagat Singh Road.
Bombay-400023.
4. M/s. J. Mahabeer & Co. Pvt. Ltd.
3620-21 Netaji Subash Marg, Delhi-110006.

12. Addresses on Raw Material**List of Paper Manufacturers in India**

1. M/s. Titaghur Paper Mills Co. Ltd., Chartered Bank Building Calcutta.
2. M/s. India Paper Pulp Co. Ltd. 8, Clive Row, Calcutta.

3. M/s. Bengal Paner Mills Co. Ltd., 14, Netaji Subbush Road Calcutta.
4. M/s. Star Paper Mills Ltd., 27, Brabourne Road, Calcutta
5. M/s. Rohtas Industries Ltd., Dalmianagar.
6. M/s. Ashok Paper Mills Ltd., 8, Russal Street, Calcutta.
7. M/s. Orient Paper Mills Ltd., Birla Building, 9/1 R. N. Mukherjee Road, Calcutta.
8. M/s. Straw Products Ltd., (L. K.) Nehru House, 4, B.S. Zafar Marg, New Delhi-110002.
9. M/s. Ballarpur Industries Ltd., (Shree Gopal Division), Thaper House, 124, Janpath, New Delhi.
10. M/s. Orient Paper Mills Ltd. (Amlai, Bhogal) Birla Building 9/7, R. N. Mukherjee Road, Calcutta.
11. M/s. Rohit Pulp and Paper Mills Ltd., Rohit Chambers, Ghoga Street, Bombay-400001.
12. M/s. Paper and Pulp Conversions Ltd., 1183/Shivajinagar, Fergusson College Road, Poons.
13. M/s. Laxmi Board and Paper Mills Pvt. Ltd., 23, Raman Street, 3rd Floor, Bombay.
14. M/s. Sirpur Paper Mills, Kaghaznagar, Sirpur.
15. M/s. Andhra Pradesh Pulp and Paper Mills Ltd., Rajahamundry.
16. M/s. Mysore Paper Mills Ltd. Bhadravati.
17. M/s. West Coasts Paper Mills Ltd., Shreeniwas House, Dr. Somani Marg, Fort, Bombay.
18. M/s. Madhya National Paper Mills Ltd, 7, Museum Road, Bangalore.
19. Ms. Punalur Paper Mills Ltd., Punalur, Travancore.
20. M/s. Seshasaye Paper and Boards Ltd., P.O. Cauvery(Salem) Erode.
21. M/s. Sun Paper Mills Co. Ltd. Post Bag No. 2, Cheranmahadevi, Tirunelveli Distt.
22. M/s. Tribeni Tissue Ltd., 3, Middleton Street, Calcutta
23. M/s. Upper India Couper Paper Mills Ltd., Masjit Rooh, Lucknow.
24. M/s. Chemopulp Tissues, A-4 Sect. CXII Meerut Road, Ghaziabad.
25. M/s. Swatantra Bharat Paper Mills, 5/7, P.B. Gupta Road, New Delhi.
26. M/s. Gujarat Paper Mills Ltd. Rarejadi, P. O. Mandej, Dist. Ahmedabad.
27. M/s. Central Pulp Mills Ltd., Fort Sonagath, Dist. Surat.
28. M/s. Deccan Paper Mills Co. Ltd., Commonwealth Bldg. poona.,
29. M/s. Amaravathi Sri Venkatesh Paper Mills Ltd. P. O Uddmalpeth, Madathukula, Tamil Nadu.
30. M/s. Associated Pulp and Paper Mills Ltd., B. Jadav Chambers, 2nd Floor, Ashram Road, Ahmedabad-380009.

(Reserved item Sl. No. 57)

I. Introduction

With the development of textile and handloom industries in India there is a great demand for paper cones. Especially now a lot of thrust is given for handloom industry. The manufacture of paper cones in rural area will be a ideal proposition. The complete plant & machinery and raw materials for the manufacture of paper cones are available indigenously.

II. Technical Aspects**(a) Process Outline :**

The paper board reel is attached to the machine at one and the web (paper) is threaded through the machine up to the other end and the automatic machine is started. While the machine is in operation the paper is first embossed between two rollers edges ground to the required angle at the pro-adjusted place. The required shape is out by two pairs of knives and one end of the piece is automatically succeed on to the winding spindle by vacuum. Next while the spindle begin to rotate paste is applied by the automatic brush and wound as cones. While cone is being wound the base part and nose part is trimmed by special circular knives, Lastly the finished cone is ejected out on to the tray by compressed air. The wet cones are dried suitably in open air or in drier. After the cones are dried the nose part is nosed (turned smooth) in the nosing machine. Now the cones are ready for selecting and packing.

(b) Quality specifications : As per customer's specifications.

(c) Production capacity (per annum on single shift working).

(i) Quantity-24,00,000 nos.

(ii) Value—Rs. 4,32,000/-

(iv) Motive power : 20 H.P.

III. Financial Aspects**(i) Fixed Capital**

Built area—

Office, Stores etc. 100 sq. metres

Working shed—400 sq. metres.

2,500 (Rented)

(ii) Machinery & Equipment :**(a) Production Unit**

(1) Automatic Cone making machine with complete tackles for making 9"×15"

cones with vacuum type making spindle separate vacuum and compressed air unit spare grinder individual power driven, with starters etc. total HP 7.5 production 22 to 25 cones per minute .	Rs. 99,500
(2) 3 Spindle housing machine 2 HP	21,700
(3) Paste preparing unit ½HP	3,850
(4) Dust Extracting Chamber with fan etc. 2 HP	10,450
(5) Special Model Circle Knife grinding machine ¼HP	3,000
(6) Automatic Printing machine attachable to cone machine	6,500

(b) Testing Equipments	1,45,000
(c) Installations @ 10% & Electrification	1,000

1,61,000

(iii) Cost spares etc.	4,000
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(iv) Office furniture	5,000
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Total Rs.	1,70,000
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2. Working capital (per month)**1. Personnel :**

1. Manager	1	800	800
2. Clerk/Accountant	1	400	400
3. Foreman	1	600	600

Technical

4. Skilled workers	5	300	1,500
5. Unskilled worker	4	250	1,000

+15% Pre requisites . 4,300

say Rs. 5,000

(ii) Raw Materials including packaging requirements (per month)

(1) Paper Box—Indigenous	Rs.		
@ 2.50/Kg.		62.50 kg.	15,625
(2) Starch @ Rs. 2/kg.		250kg.	500
(3) Packing material-do.-		L.S.	575

Total cost of raw materials . 16,700

(iii) Utilities per month

Power— 4000 KWH	30 paise/unit	1,200
		1,200

(iv) Other contingent expenses (per month)	Rs.
(1) Rent	2,500
(2) Postage & Stationery	200
(3) Repairs & Maintenance	200
(4) Transport & insurance	200
(5) Miscellaneous expenditure	300
	<u>3,500</u>
(v) Total recurring expenditure/month	26,400
(vi) Working capital 1 for 3 months	79,200
	<u> </u>
3. Total capital Investment	
(i) Fixed capital	1,70,000
(ii) Working capital	79,200
	<u>2,49,200</u>
	<u> </u>
4. Cost of production per annum	
Total recurring cost per year	3,16,800
Depreciation on machinerys@ 10%	17,000
Interest on total investments@ 15%	37,380
	<u>3,71,180</u>
	<u> </u>
5. Turnover (per year)	
(i) Paper cones 24 lakhs 180/per 1000 cones	4,32,000
6. Net profit per year.	60,820
7. Net profit ratio. 15% approx.	
8. Rate of return. 24% approx.	
9. B.E.P. 63% approx.	
10. Suppliers of Raw materials :	
1. M/s. South India Paper Mills Pvt. Ltd., Chikkayana Chatra P.O. Nanjengudu- (Mysore St.)	
2. M/s. Lakshmi Board and Paper Mills Pvt. Ltd., Plot No. 2, MIDC Area, Kalyan Bhivardi Road, Kalyan (S. Rly.).	
3. M/s. Rajagopalan Paper & Board Mill, Umayalpuram, Rayavaram P.O. 622506. Pudukkottai Dt.	

4. M/s. Punalur Paper Mills,
Punalur (Kerala State).
5. M/s. Orient Paper Mills Limited,
Bajaj Nagar, Sambalpur Dist.
6. M/s. Star Paper Mills Ltd., Sharanpur.
7. M/s. Punalur Paper Mills Ltd.,
Punalur, Quilon Dist.
8. M/s. Rohtas Industries Ltd., Dalninagar.
9. M/s. Mysore Paper Mills Ltd., Bhadravati.
10. M/s. West Coast Paper Mills Ltd., Dandeli,
North Kanara Dist.

11. Machinery

1. M/s. Micro Mechanical Works,
L.B.S. Marg, Vikhroli,
Bombay-83.
2. M/s. K.U. Sodalamuthu & Co.,
15/94 Mettupalayam Road,
Coimbatore-641011.
3. M/s. Indo Europe Trading Co.,
Chandni Chowk, Delhi-110006.

9. Break even point (% of total production envisaged).	Rs.
Fixed Cost—	
(a) Depreciation on machines & equipments	17,000
(b) Rents	30,000
(c) Interest on total investment	37,380
(d) Insurance	1,800
(e) 30% of salary & wages	18,000
(f) 30% of other contingent expenses	3,060
	<u>1,07,240</u>
Total fixed cost	1,07,240
Net profit per year	60,820
Break even points %—	F.C. × 100
	<u>F.C. + P</u>
	<u>1,07,240 × 100</u>
	<u>1,07,250 + 60,820</u>
	<u>=63%</u>
(Reserved item Sl. No. 62)	

I. Introduction

Due to the rapid industrialisation taking place in the country, the demand for office stationery and allied items is fast increasing. Paper Envelopes plays an important position as a stationery material in any type of correspondence. Presently the emphasis of the government is the setting up of more and more industries in the backward and rural areas to improve the lot of common people leaving in the remote part of the country. Number of government offices/establishments, financial institution are being set up in the remote part of the country. Paper envelopes are an ideal medium of corresponding between two establishments. Thus there is a tremendous scope for setting up of industry in the rural areas for paper envelopes and other stationery articles.

II. Technical Aspects

(i) Process Outlines

First the paper is cut to the required size of the envelope. It is then fed in blocks of 150-200 sheet, depending upon the thickness of paper, in the Envelope making machine wherein these are cut in to the shape of envelope. These are then folded, glued to required shape of the envelope.

(ii) Quality Specifications

IS : 3338-1965

(iii) Production Capacity (per annum)

(a) Quantity—90 lakhs Nos. (size 14"×9" cm.)

(b) Value—Rs. 4,10,10,000/-

(iv) Motive Power—5 H.P.

III. Financial Aspects

(1) Fixed Capital

(i) Land and Building

Built area—

Office, Stores—50 sq. metres

Working Shed. 50 sq. metres

(Rented)

(ii) Machinery & Equipments

(a) Production unit :

		Rs.
1. Paper cutting Machine 42"	1	5,000
2. Envelope Making Machine		
Size. 23"×18"	1	8,000
Size 34"×24"	1	12,000

(b) Testing Equipments

Physical balance, metre scales etc.

Rs.
1,000

(c) Electrification & Installation charges

2,600

28,600

(iii) Cost of Moulds/dies etc.

3,900

(iv) Cost of office Equipment/working tables etc.

2,500

35,000

2. Working Capital

(i) Personnel Administrative and Supervisory

Rs.

Manager	1	800	800
Salesman	1	500	500
Clerk-cum-typists	1	400	400
Deliveryman/Peon	1	200	200

Technical

Skilled worker	3	400	1200
Unskilled Workers	8	300	2400

5400

Perquisites @ 15% salaries .

800

6200

(ii) Raw Materials

Paper 2700 kgs. @ Rs. 6/50 per kg.	17,550
Gum, Labels etc.	575
Packing boxes (card board) 7500 nos. @ 25 each	1875

20,000

(iii) Utilities

Power 600 KWH@ 30P per unit	180
Water	20

200

(iv) Other Contingent Expenses

Rent	500
Postage & Stationery	100
Telephones	50
Consumable stores	50
Repairs & Maintenance	100
Publicity & Advertisement	500
Transport charges	200
Insurance	50
Miscellaneous	450

2000

	Rs.
(v) Total Recurring Expenditure (per month)	
Personnel	6,200
Raw Materials	20,000
Utilities	200
Contingent Expenses	2,000
	28,400
(vi) Working Capital for 3 months	85,200
3. Total Capital Investment	
Fixed Capital	35,000
Working capital	86,200
	1,20,200
4. Cost of Production (per year)	
Total recurring cost per year	3,40,800
Depreciation on Machinery & Equipment @ 10%	2,860
Depreciation on Mould & Dies @ 25%	925
Depreciation Office equipment etc. @ 20%	625
Interest on Capital Investment @ 15%	18,040
	3,63,250
Say	3,63,250
5. Turnover (per year)	
By sale of 90 lakhs of Envelope (size 14" x 9 cms.) @ Rs. 40/- per thousand envelopes	4,32,000
Sales Commission @ 5%	22,000
	4,10,000
6. Net Profit (per year)	46,750
7. Net Profit Ratios 11%	
8. Rate of Return 38%	
9. B.E.P. 58%	

Addresses of Machinery & Equipment Suppliers

1. M/s. Indo Europe Trading Co. 1396 Chandni Chowk, Delhi-110006, and their offices at Bombay, Calcutta & Madras.
2. M/s. Printers House Pvt. Ltd. 10, Scindia House, Con. Place, New Delhi-110001.
3. M/s. Industrial Paper Machines (P) Ltd.
(i) A-32 Industrial Area, Phase I, New Delhi.
(ii) Sonawala Indl. Estate, Andheri East, Bombay.
4. M/s. Gunvaritry & Company, Ground Floor, 41, Tamarind Lane, Fort, Bombay-400001.
5. M/s. Anna Engineering Works, Quilon Kerala.
6. M/s. Associated Packaging Machinery Co. 8, Lyons Range, Calcutta-700001.
7. M/s. Bhawani Industries, 2, 1st Cross, K.V. Temple Street, Bangalore-53.

List of Paper Manufacturers in India

1. M/s. Titaghur Paper Mills Co. Ltd., Chartered Bank Building, Calcutta.

2. M/s. India Paper Pulp Co. Ltd. 8, Clive Row, Calcutta.
3. M/s. Bengal Paper Mills Co. Ltd., 14, Netaji Subhash Road, Calcutta.
4. M/s. Star Paper Mills Ltd., 27, Brabourne Road, Calcutta.
5. M/s. Rohtas Industries Ltd., Dalmianagar.
6. M/s. Ashok Paper Mills Ltd., 8, Russel Street, Calcutta.
7. M/s. Orient Paper Mills Ltd. Birla Building, 9/1 R.N. Mukherjee Road, Calcutta.
8. M/s. Straw Products Ltd., (I.K.) Nehru House, 4, B.S. Zafar Marg, New Delhi-110002.
9. M/s. Ballarpur Industries Ltd., (Shree Gopal Division), Thapar House, 124, Janpath, New Delhi.
10. M/s. Orient Paper Mills Ltd., (Amlai,) Bhopal Birla Building, 9/7, R.N. Mukherjee Road, Calcutta.
11. M/s. Rohit Pulp and Paper Mills Ltd., Rohit Chambers, Ghoga Street, Bombay-400001.
12. M/s. Paper and Pulp Conversions Ltd., 1183/Shivajinagar, Fergusson College Road, Poona.
13. M/s. Laxmi Board and Paper Mills Pvt. Ltd., 23, Raman Street, 3rd Floor, Bombay.
14. M/s. Sirpur Paper Mills, Kaghaznagar, Sirpur.
15. M/s. Andhra Pradesh Pulp and Paper Mills Ltd., Rajamundry.
16. M/s. Mysore Paper Mills Ltd., Bhadravati.
17. M/s. West Coasts Paper Mills Ltd., Shreeniwas House, Dr. Somani Marg, Fort, Bombay.
18. M/s. Madhya National Paper Mills Ltd., 7, Museum Road, Bangalore.
19. M/s. Punalur Paper Mills Ltd., Punalur, Travancore.
20. M/s. Seshesaye Paper and Boards Ltd., P.O. Cauvery (Salem), Erode.
21. M/s. Sun Paper Mills Co. Ltd., Post Bag No. 2, Cheranmahadevi, Tirunelveli Distt.
22. M/s. Tribeni Tissue Ltd., 3, Middleton Street, Calcutta.
23. M/s. Upper India Couper Paper Mills Ltd., Masjid Road, Lucknow.
24. M/s. Chemopulp Tissues, A-4 Sect. CXII Meerut Road, Ghaziabad.
25. M/s. Swantantra Bharat Paper Mills, 5/7, D.B. Gupta Road, New Delhi.
26. M/s. Gujarat Paper Mills Ltd., Barejadi, P.O. Mandej, Dist. Ahmedabad.
27. M/s. Central Pulp Mills Ltd., Fort Sonagath, Dist. Surat.
28. M/s. Deccan Paper Mills Co. Ltd., Commonwealth Bldg., Poona.
29. M/s. Amaravathi Sri Venkatesh Paper Mills Ltd., P.O. Udaimalpeth, Madathukula, Tamil Nadu.
30. M/s. Associated Pulp and Paper Mills Ltd., B. Jada Chambers, 2nd Floor, Ashram Road, Ahmedabad 380009

(Reserved item Sl. No. 59)

PAPER NAPKINS & TOILET
PAPER ROLLS & FACIAL TISSUES

I. Introduction

Paper napkins are becoming increasingly popular with the catering industry due to its manifold usages. These are absorbent, hygienic, light and can be had with attractive printing. Facial tissue paper though recently introduced in Indian market is fast becoming popular with the public due to its lightness, absorbent, hygienic and handy in nature. Similarly, toilet papers are widely used for sanitation by almost all the big hotels, restaurants, Cinema houses etc.

Due to the government emphasis for popularising tourism, number of new hotels, tourists resorts, holiday homes etc. are coming up very fast in the country. These are bound to increase the demand of the paper conversion products like paper Napkins, Toilet paper rolls etc.

II. Technical Aspects

(a) Process Outlines

Tissue paper rolls are fed to the Flexographic printing machine for paper Napkins wherein these are printed and cut to the sizes with the device already fixed with the machine. Similarly Toilet paper rolls are slitted on Roll making machine, rewinded on the paper or wooden core to the required sizes. These are then packed in numbers or as desired.

(b) Quality, Specifications

As per customer's specifications.

(c) Production Capacity

Quantity—300 Metric Tonnes.

Value—Rs. 66,82,500

(d) Motive Power : 15 H. P.

III. Financial Aspects

1. Fixed capital

(i) Land and Building

Land	400 sq. metres.
Built area Office, stores etc.	50 sq. metres.
Working Shed.	200 sq. metres (Rented)

(ii) Machinery & Equipment

(a) Production Unit

	Rs.
1. Two colour Flexographic printing machine for paper napkins.	1 40,000

2. Toilet Paper roll making Machine, 9-Stations, with arrangements for rewinding, perforating, cutting arrangements	1	Rs. 35,000
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(b) Testing Equipments

Physical balance, metre scale etc.	1,000
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(c) Installation & Electrification

7,500

(iii) Cutting printing dies etc.

5,500

(iv) Office Equipment, furniture etc.

5,000

94,000

2. Working Capital (per month)

(i) Personnel

Administrative and Supervisory

Manager	1	1000	1000
Salesman	2	500	1000
Clerk-cum-typist	1	400	400
Accountant	1	600	600
Peon-cum-Deliverymen	2	200	400

Technical

Supervisor	1	600	600
Skilled Workers	6	400	2400
Unskilled Workers	5	300	1500

7,900

Perquisites 15%

1,100

9,000

(ii) Raw Materials

Tissue Paper (All grades) 25 M.T.	
Indigenous @per M.T. 17,000/-	3,85,000

Paper Cartons, Corers, Polyethylene film & other packing materials L.S.	13,000
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Inks, thinners etc.	2,000
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4,00,000

(iii) Utilities

Power 3000 KWH @ 30 P unit	900
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Water, Fuel etc.	50
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950

(iv) Other Contingent Expenses

Rent	2000
Postage & Stationery	200
Telephones	100
Consumable stores	200
Repairs & Maintenance	500
Transport charges	500
Advertisement & Publicity	1500
Insurance	500
Miscellaneous expenses	550

6,050

(v) Total Recurring Expenditure (per month)	Rs.
Personnel	9,000
Raw Materials	4,00,000
Utilities	950
Contingent Expenses	6,050
	4,96,000
(vi) Total Working Capital for 3 months	14,08,000
3. Total Capital Investment	
Fixed Capital	94,000
Working Capital	14,88,000
	15,82,000
4. Cost of Production	
Total recurring cost per year	59,52,000
Depreciation on Machinery & Equipment @ 10%	8,250
Depreciation on Dies, testing equipments etc. @ 25%	1,650
Depreciation on Office equipment @ 20%	2,000
Interest on Capital Investment @ 15%	2,37,300
	62,01,200

5. Turn Over (Per year)

By sale of Paper Napkins,	300 MT
Toilet Paper Rolls, Facial Tissues etc. @ Rs. 22,500/- per MT	67,50,000
Wastage 1%	67,500
	66,82,500

6. Net Profit Per year (5—4)	4,81,300
7. Net Profit Ratio	7.2%
8. Rate of Return	30.4%
9 B.E.P.	41.6%

10. Addresses of Machinery & Equipment Suppliers

1. M/s. Industrial Paper Machines (P) Ltd.
i. A-32, Naraina Industrial Area, Phase I, New Delhi.
- ii. Sonawala Industrial Estate, Andheri East, Bombay.
2. M/s. Indo Europe Trading Co.
1396, Chandni Chowk, Delhi-110006.
3. M/s. Akeme Paper Machines,
D-23, N.D.S.E. Part I, New Delhi.
4. M/s. Associated Packaging Machinery Co.
8, Lyons Range, Calcutta-700001.
5. M/s. Bhavani Industries,
2, 1st cross, K.V. Temple Street, Bangalore-53.

Addresses of Raw Materials Suppliers

Tissue Paper

M/s. Sehgal Papers (P) Ltd.,
55, Nehru Place, Meghadoot, New Delhi.

(Reserved item Sl. No. 65, 71 & 70)

PAPER TUBES

I. Introduction

The manufacture of paper Tubes and Bobbins is a good proposition to be undertaken in the small scale basis. There is very good demand from textile, Handloom and other yarn manufacturing units. The raw material and machinery involved in the manufacture of these items are being manufactured indigenously.

II. Technical Aspects

(a) Process Outline

The paper reel is placed on machine and it is wound as required thickness and required sizes. These tubes are finally cut to required sizes and impregnated in resin solution.

(b) Quality Specifications

As per customer's specification.

(c) Production capacity (per annum on single shift working)

(i) Quantity Rs. 60,00,000 Nos. (full size)

(ii) Value—Rs. 16,50,000/-

(d) Motive Power (requirement) of HP approx : 15 H.P

I. Financial Aspects

(i) Land & Building :

Built area office stores etc. 100 sq. metres
Working shed—400 sq. metres

Rental

(ii) Machinery and Equipment

	Rs.
1. Paper slitting machine 36" latest special type.	20,000
2. Edge Grinding machine latest improved model.	18,000
3. Dust Extracting machine	9,500
4. Taper and Straight tube winding machine large	50,000
5. Taper and straight tube winding machine small	40,000
6. Paste preparing unit	3,500
7. Drier	30,000
8. Tube compressor 2 nos.	60,000
9. Corrugator 1 no. ABR type	50,000
10. Farrule fixing machine semiautomatic	5,000
1. Resein impregnating vessel with compressor	35,000
2. Paint Dipping arrangements	5,000

13. Electrically heated or oil firing curing oven.	Rs. 50,000
14. Automatic Hopper feed tube cutting machine.	18,000
15. Other Sundry articles and spare parts worth.	10,000

4,04,000

Installation @ 10% 40,400

4,44,400

Furniture etc. 4,600

4,49,000

Working capital per month

(i) Personnel	No.	Rate	
1. Foreman	1	400	400
2. Manager	1	800	800
3. Clerk/Store keeper	1	300	300
4. Accountant	1	500	500
Technical			
5. Skilled workers	6	300	1,800
6. Unskilled „	6	250	1,500

5,300

+15% prerequisite 795

6,095

(ii) Raw Materials including Packaging requirements (per month)

1. Paper (including wastage) 17.5 tons 4000/tons	Rs. 70,000
2. Casein adhesive 700 kg. @ Rs. 8/- per Kg.	5,600
3. Resin Mixture 1500 kg. @ Rs. 9/- per kg.	13,500
4. Packing material L.S.	5,000
(A l indigenous)	94,100

(iii) Utilities

Electricity—3000kwh @ 0.30 np/unit	900
	900

(iv) Other contingent expenses (per month)

1. Rent	2,500
2. Post & Stationery	200
3. Repairs & maintenance	2,000
4. Transport	2,000
5. Insurance	500
6. Miscellaneous	500
	7,700

	Rs.
(v) Total recurring expenditure (per month)	1,08,795
(vi) Total working capital for 3 months	3,26,385
Total Capital Investment	
(i) Fixed capital	4,49,000
(ii) Working capital for 3 months	3,26,385
	7,75,385

Cost of Production

1. Total recurring cost per year	13,05,540
2. Depreciation on machinery @ 10%	44,900
3. Interest on total investment @ 15%	1,16,300
	14,66,740

Turn-Over/Annum :

Tubes of different size. 60 lakhs nos. 275/-

1000 tubes	16,50,000
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Net Profit per year :

Net profit ratio	11% approx.
Rate of return	24% approx.
B.E.P.	71%

Break even point (% of total production envisaged) :

Fixed Cost :

(a) Depreciation on machineries & equipment.	5,38,800
(b) Rent	30,000
(c) Interest on total investment	1,16,740
(d) Insurance	6,000
(e) Salary & wages	29,290

(f) Other contingents	56,400
	7,79,230
Net profit per year	1,83,260

$$\begin{aligned}
 \text{B. E. P. \%} &= \frac{\text{F.C.} \times 100}{\text{F.C.} + \text{P}} \\
 &= \frac{7,79,230 \times 100}{7,79,230 + 1,83,260} \\
 &= \frac{7,79,230 \times 100}{9,62,490} \\
 &= 71\%
 \end{aligned}$$

Supplier of Machinery

1. M/s. K.U. Sodalmuthu & Co.,
15/94, Mettupalayam Road,
Coimbatore-641011.
2. M/s. Mirco Mechanical Works,
L.B.S. Marg, Vikhroli,
Bombay-83.
3. M/s. Indo Europe Trading Co.
Chandni Chowk, Delhi-110006.

Raw Material suppliers :

1. M/s. Orient Paper Mills Limited,
Bajaj Nagar, Sambalpur Distt.
2. M/s. Star Paper Mills Ltd., Sharanpur.
3. M/s. Punalur Paper Mills Ltd., Punalur, Quilon Distt.
4. Rohtas Industries Limited, Dalmnagar.
5. M/s. Mysore Paper Mills Ltd., Bhadravati.
6. M/s. West Coast Paper Mills Ltd., Dandeli, North
Kanara Dist.

(Reserved item Sl. No. 63)

I. Introduction

Paradichlorobenzene, a white crystalline powder, is normally available as a bye-product from chlorobenzene manufacturers. It is used as a raw material for seeing optical whitening objects. PDCB in cube/cane is extensively used as a moth-repellant.

II. Technical Aspects**(a) Process Outline**

Paradichlorobenzene is mixed with paraffin wax/casein/a bonding agent. In some cases for reducing the cost of production soap stone powder is used as a filler. Paradichlorobenzene and paraffin wax are melted together in jacketted vessel. Fillers are added to it before thorough mixing. The mass is then crushed into power in granular form. The granulated mass is then converted to balls by ball making machine. In the case of cube the whole mass is melted and transferred to the moulds having cubical holes. After cooling the cubes are taken out and packed in cellophane or a polythene for marketing.

Typical formulae are given below for guidance :

- (i) Para-di-chlorobenzene 750 Gms.
- (ii) Naphthalene Powder 350 Gms.
- (iii) Camphor Oil 50 Gms.
- (iv) Paraffin Wax 150 Gms.
- (v) Soap Stone Powder 150 Gms.
- (vi) White Oil 50 Gms.

(b) Quality Specifications

The quality control for moth properties may be ascertained that 450 Gms. of para-di-chlorobenzene per 100 cubic feet gives a mortality of 100% of the larvae and eggs of webbing cloth moth in four days.

(c) Production Capacity (Per annum.)

(a) Quantity—1 20 M. T.

(b) Value Rs. 9,60,000/-

III. Financial Aspects**(I) Fixed Capital****(i) Land / Building**

Land—100 sq. mts.	
Built up area—50 sq. m.	
Consisting of working shed, office, stores etc.	Rs. 50,000.00

(ii) Machinery & Equipments

(a) M. S. Jacketted vessel cap. 250 lts. with stirrer of 2 HP motor and other complete accessories.	2 nos.	8,000.00
(b) Baby Boiler	1 No.	7,000.00
(c) Moulds	3 Nos.	1,500.00
(d) Ball making Machine rotary type	1 No.	2,000.00
(e) Granulating Machine	1 No.	2,500.00
(f) Misc. Tools & Equipments		1,000.00
(g) Weighing scale . installation & Electrification of Machinery & equipments	1 No.	1,000.00
(i) Enamelled vat at 100 lts. capacity.	2 Nos.	500.00
(j) Tube well, water connection etc.		5,000.00
(k) Office Equipments & working table :		1,600.00
Total		46,500.00

2. Working Capital (Per Month)**(i) Personnel**

Administrative & Supervisory		Rs.
Clerk/Cashier	1 No.	400.00
Typist/storekeeper	1 No.	400.00
Peon/Darwan	1 No.	300.00

Technical

Skilled workers	2 Nos.	400.00
Unskilled workers	4 Nos.	1,200.00

Total 2,700.00

Perquisite @ 15% of salaries 405.00

3,105.00

(ii) Raw materials (including packaging requirements).

(a) Para-di-chlorobenzene—6000 kg.	Rs. 48,000.00
@ Rs. 8/- per kg.	
(b) Paraffin Wax 2800 Kg. @ Rs. 4/- per kg.	11,200.00
(c) Soap Stone powder 1500-Kg @ Rs. 0.50 per kg.	750.00
(d) Packaging materials	3,300.00
Total	Rs. 63,250.00

(iii) Utilities (Per Month)	Rs.
Powder -5 KWH	200-00
Fuel	300-00
Total	500-00

(iv) Other Contingent Expenses (P. M.)

	Rs.
(a) Rent	500-00
(b) Postage/Stationery	200-00
(c) Telephone	150-00
(d) Consumable stores	250-00
(e) Repairs/maintenance	150-00
(f) Advertisement	1500-00

Rs. 1,350-00

(v) Working Capital for 3 months

(i) Raw-materials Rs- 63250×3	1,89,750-00
(ii) Salaries Rs. 3105×3	9,315-00
(iii) Utilities Rs. 500×3	1,500-00
(iv) Other contingents Expenses: 1350×3	4,050-00
	2,04,615-00

3. Total Capital Investments

(i) Fixed Capital	46,500-00
(ii) Working capital for 3 months.	2,04,615-00
	2,51,115-00

4. Cost of production (Per Year).

Total recurring costs.	8,18,460-00
Dep. of m/c. & equipments @ 10%	4,450-00
Depreciation on office equipments @ 20%	400-00
Interest on total capital investment @ 15%	37,776-00
	8,61,086-00

5. Turn-over (Per Year).

(i) Para-di-chlorobenzene balls/ Cubes

120 M. T.	Rs. 9,60,000-00
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(ii) Less Sales Commission 48,000-00

9,12,000-00

6. Net Profit (Per Year)
(before taxation)

51,914-00

7. Net Profit Ratio 5%

8. Rate of return (on total capital) 20-6%

9. Break-even-point.. 30%

10. Suppliers of Machinery & Equipments.

- M/s. Macneill & Magor Ltd.
28-K. G. Marg, New Delhi.
- M/s. Small Machinery Manufacturing Co.,
22-R. G. Kar Road,
Calcutta-4.
- M/s. Oriental Machines, Supplying Agents,
20, R. N. Mukerjee Road,
Calcutta-1.

11. Suppliers of Raw-Materials.

- M/s. Durgapur Chemicals Ltd.
6-A, Little Russel Street,
Calcutta-16.
- M/s. Herdulia Chemicals, Thana,
Maharashtra.
- M/s. Vijay Industries,
Sabun Bhavan,
107-Sheriff Devji Road,
Bombay-.

(Reserved item Sl. No. 228)

I. Introduction

Lead Pencils are used for writing and drawing on paper. Depending on the type of carbon used in them they could be categorised as soft, medium and hard pencils. There are about 15 pencil factories in India in the Organised Sector with a total installed capacity of about 2 million gross pencils per annum. Besides, there are a number of small scale units producing pencils using indigenous pencil making machinery.

Establishment of more small scale units can be considered for making pencils in areas close to sources of suitable species in the interest of more economic production and development of backward areas. The hill areas of North and Andman Islands are instances of such suitable locations.

II. Technical Aspects

(a) Process Outline

The slats are usually available in 6-or 8-ply i.e. in dimensions $184 \times 55 \times 5.5$ mm or $184 \times 70 \times 5.5$ mm and may sometime need sizing to accurate lengths on slat sizing machine. After sizing the slats are passed through the grooving machine which produces grooves on one face of the slats only. The grooved slats are then filled up with lead slips and glued in pairs to form glued and leaded blocks. These are kept in the press overnight for setting of the glue. The blocks are then fed into the double shaping machine. The pencils so obtained are then passed through the sanding, lacquering and stamping operations. Finally they are passed through the ends-cutting machine & packed in small card board boxes.

Quality Specification

(b) Indian Standard IS-3084-65.

(c) Production Capacity (per annum)

(a) Quantity—90,000 gross pencils.

(b) Value Rs. 23,40,000 (@ Rs. 26 per gross).

(c) Motive Power Requirement— 35 H. P. approx.

III. Financial Aspects

1. Fixed Capital Investment

(a) Land Building

Land : 1000 sq. meters. @10 sq. m.

Rs.
10,000.00

Built Area—Office Stores etc. $40' \times 10'$ @	Rs.
Rs. 30/- sq. feet.	12,000.00
Working Shed $60' \times 40'$ @ Rs. 25/- sq. feet	60,000.00
Total approximate Cost	82,000.00

(b) Machinery & Equipment

Production units

S. No.	Description	Qty.	Price (Rs.)
(i)	Automatic slat sizing Machine with 2 H. P. 1440 rpm motor. (double circular saw)	One	10,000.00
(ii)	Automatic Grooving Machine for making multiple groovers, with hopper feed, one 7.5 H.P. 3000 rpm motor, capacity 400 gross pencils per shift	One	37,500.00
(iii)	Automatic Double shaping Machine with 10 H. P. 3000 rpm motor, capacity 400 gross pencils, per shift	One	40,000.00
(iv)	Automatic colouring Machine with 1 H. P. 1440 rpm motor	Two	13,600.00
(v)	End-cutting machine, semi-automatic, with 3 H. P. 1440 r. p. m. motor, capacity 400 gross pencils per shift	One	17,750.00
(vi)	Automatic stamping Machine with 2. H. P. 1440 r. p. m. motor, capacity 400 gross pencils per shift	One	9,000.00
(vii)	Glue Press (Hand operated)..	One	1,500.00
(viii)	U type for the glue press		3,000.00
(ix)	Cutter for Hexagon & round Pencils & grooving cutters		7,500.00
(x)	Cutting & Grinding Machine for cutting & sharpeners of Cutters, with 2 H. 1440 r. p m. motor	on	
(xi)	Sanding Machine for pencils with 2. H. P. 1440 r. p. m. motor	One	25,000.00
(xii)	Miscellaneous Machines for fancy colour designs		15,000.00
			1,84,850.00
(xiii)	Electrification & Installation charges @ 10% of cost of Machine & equipment		18,150.00

(xiv) Total cost of Machinery & equipment	2,03,000.00
(xv) Towards office equipments	5,000.00
Total Fixed Capital Investment. (i)+(ii)+(iii)	2,90,000.00

2. Working Capital (per month)

(a) Raw Materials

(i) Wooden Slat (6 ply) 300 gross $\times$ 25 days + 10% wastage of slats $7500 + 750 = 8250$ gross @ Rs. 6 per gross pencils slats.	49,500.00
(ii) Lead slips 7500 gross + 10% wastage of lead. i. e. 8250 gross @ Rs. 5 per gross (HV lead slips)	41,250.00
(iii) Glue, lacquer & foil for stamping 7500 gross pencil @ Rs. 7/- per gross	52,500.00
(iv) Packing for 7,500 gross pencils (@ Rs. 2 gross pencils)	15,000.00
	1,58,250.00

(b) Personnel

Designation	Nos.	Salary (Rs.)	Total (Rs.) P. M.
(i) Manager-Technologist	1	1200	1200.00
(ii) Supervisor	1	1000	1,000.00
(iii) Skilled workers (1 on grooving machine and 1 on shaping machine)	2	700	1,400.00
(iv) Semi-skilled workers (for colouring and cutting, stamping, slat sizing sanding & cutter grinding machine)	6	500	3,000.00
(v) Semi-skilled workers (for glue press).	4	400	1,600.00
(vi) Unskilled workers for packing	4	300	12,00.00
(vii) Clerk/Typist	1	500	500.00
(viii) Watchman	1	300	300.00
			10,200.00

(c) Utilities other Miscellaneous Expenses

(i) Power—4000 KWH Units @ 30 Paise per unit	Rs. 1,200.00
(ii) Water	50.00
(iii) Taxes & Postage, Insurance etc.	1,250.00
(iv) Transport charges	1500.00
(v) Other unforeseen Expenses	1,000.00
Total	5,000.00

(d) Total Recurring Expenditure (per month)	1,73,450.00
(e) Total Working Capital (3 months basis)	5,20,350.00

3. Total Capital Outlay

(i) Fixed Capital	2,90,000.00
(ii) Working Capital	5,20,000.00

Total I & II	8,10,000.00
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4. Cost of Production (Per year)

(i) Total recurring cost per year.	20,80,000.00
(ii) Depreciation on Building @ 5%.	3,600.00
(iii) Depreciation on machinery & equipment @ 10%	20,000.00
(iv) Depreciation on office equipment @ 20%.	1,000.00
(v) Interest on total investment @ 15%	1,21,500.00
	22,26,100.00
(Say)	22,30,000.00

5. Turn-over (per year)

90,000 gross pencils @ Rs. 27 per gross (300 gross per day)	24,30,000.00
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6. Net Profit per year (5-4)	2,00,000.00
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8. Rate of Return	24%
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9. Break Even Point	52%
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Addresses of Machinery & Equipment Suppliers

(i) The Central Mechanical Engineering Research Institute, Durgapur, West Bengal.

(ii) M/s. Standard Pencil Factory, Super A-546 Industrial Estate, Guindy, Madras-32.

(iii) M/s. Bhupindra Engineering Works, 1298 Bapa Nagar, Military Road, Karol Bagh, New Delhi-5.

Addresses of Raw Material Suppliers

(a) Slat Makers

(i) The Manager, Govt. Joinery Mill, Pampore, Srinagar (J & K).

(ii) M/s. Bhatia Saw Mills, Near Rishikul Braham Charya Ashram, Jawalapur Road, Hardwar (U. P.)

(iii) Divisional Forest Officer, Kulu Circule, Shamshi (HP).

(b) Lead Slip Suppliers

(i) M/s. Lead Slips Products (P) Ltd, Ranjorwal, Market, Ahmedabad.

(ii) M/s. Bhupathi Pencil Factory, Perur, Coimbatore (Tamil Nadu)

(Reserved item Sl. No. 773).

I. Introduction

The Plastic Processing industry in small scale sector in the country today presents a broad and colourful spectrum comprising a large number of units producing a varied and extensive range of items of a very simple to sophisticated nature. The product range includes a large number of consumer items as well as industrial products. Plastic moulding units may be based on any one of the processing techniques viz. compression moulding, injection moulding or blow moulding etc. However many a time more than one conversion technique may be employed in the same unit in order to cover a wider range of products.

The present scheme envisages for setting up of an unit comprising of compression moulding and injection moulding sections. Bottle caps can be manufactured both from thermosetting material (UF & PF) as well thermoplastic material (PP, HIPS, HDPE etc.). The first materials are to be processed by compression moulding while the later is to be converted by injection moulding process. The flash light torch cases are to be manufactured from HDPE or polypropylene materials by injection moulding technique.

Keeping in view their capability to with stand a large number of corrosive chemicals and solvents, availability in attractive colours & designs, ease of fabrication and comparatively low cost, plastic bottle caps find extensive application in the packaging of cosmetics, soaps, drugs, chemicals and adhesives etc. With the introduction of more sophistication in packaging the use of plastic bottles caps is increasing at a very fast rate. Similarly these days plastic torch cases are preferred over the conventional metal cases, keeping in view their light weight, anticorrosive nature, availability in attractive colours and lower prices. The machines and equipment, raw materials as well the technology for the manufacture of above two items is indigenously available.

II. Technical Aspect

(a) Process outline

For the manufacture of UF/PF bottle caps hydraulic type compression moulding process are employed. The thermosetting material is put

in to the cavities of a pre-heated mould and pressed between the two platens of the press. The combined effect of heat and pressure causes cross-linking in the material leading to formation of macromolecule. This causes the compound to fill the cavity of mold and harden. After a certain time the mold is opened and the mouldings are removed.

For the manufacture of bottle caps and plastic torch cases from thermoplastic materials the process involves the following steps:

- Fixing of requisite dies in the
- Feeding of raw material in the hopper
- Injecting molten material in die
- cooling & opening of the mold
- ejection of molded piece & finishing.

(b) Quality Specifications :

Specific standards are not available for plastic bottle caps and the quality, design & standard shall depend upon performance requirements. Similarly plastic torch cases are also required to be manufactured as per market requirement.

(c) Production Capacity :

Quantity	1. UF/PF bottle caps.	8 lac pieces.
	2. Thermoplastic bottle caps.	10 lac pieces.
	3. Flash light torch cases	2.7 lac sets.
Value	Rs. 9,75,000	

III. Financial Aspects :

(I) Fixed Capital

(i) Land & Building

(a) Plot area—	300 sq. metre	Rented
(b) Covered area	250 sq. metre	
(details as under)		
Working shed	200 sq. metre.	
Office accommodation	50 sq. metre.	

(ii) Machinery & Equipment

(a) Compression moulding Section

Tableting machine	1 No.	10,000.00
Hydraulic thermosetting moulding press, capacity 25 MT, ram stroke 12", single day light size of table 16"x13", working pressure 2 tons/sq. inch. complete with arrangements of ejection, electrically operated		

with 5 H. P. motor and other accessories.	1 No.	Rs.	40,000·00
(b) Injection moulding Section			
—Semiautomatic 120 gms injection moulding machine, hydraulic mould closing, complete with all accessories, fitted with 15 H. P.	1 No	Rs.	80,000·00
—Semiautomatic vertical hydraulic injection moulding machine, 100 gms shot capacity fitted with 5 H. P. motor	1 No.	Rs.	20,000·00
—Set of moulds of bottle caps both injection & compression moulding.			5,000·00
—Set of moulds for torch case including back cover & reflector holder and other small components.			10,000·00
(c) Maintenance Unit			
Small hand tools, greasing equipment etc.			1,000·00
(d) Testing & Quality Control			
Glass apparatus & Testing instruments such as micro meters, weighting balance etc.			3,000·00
(e) Installation and electrification charges.			
			15,000·00
(f) Office equipment and furniture.			
			6,000·00
Total			1,90,000·00

2. Working Capital per month

(i) Personnel

Administrative Staff

		Rs. @	Rs.
Production Supervisor	1 No.	800	800·00
Accountant/store keeper	1 No.	500	500·00
Chowkidar	2 Nos.	200	400·00

Technical Staff

Skilled Worker	3 Nos.	500	1,500·00
Unskilled worker	4 Nos.	200	800·00

Total			4000·00
Perquisites @ 15 % of salaries			600·00
Total			4,600·00

(ii) Raw materials

UF/PF moulding powder 0·75 MT @ Rs. 15000 MT			11,250·00
PP/HDPE injection moulding grade 3 MT @ 14000 M. T.			42,000·00
Polythene bag for packing			250·00
Total			53,500·00

(iii) Utilities

Power 5000 KWH @ Rs. 0·30 per KWH			1,500·00
Water 100 KL @ Rs. 0·70 per KL			70·00
Total			1,570·00

(iv) Other contingent expenses		Rs.
Rent		2,500·00
Maintenance		500·00
Postage & Stationery		200·00
Telephone		300·00
Consumable store.		100·00
Miscellaneous		400·00
		4,000·00

(iv) Total recurring expenditure (per month)

Personnel	4,600·00
Raw material	53,500·00
Utilities	1,570·00
Other contingent expenditure	4,000·00

63,670·00

Working Capital for three months	1,91,010·00
Say	1,91,000·00

3. Total Capital Investment

Fixed Capital	1,90,000·00
Working Capital	1,91,000·00
	3,81,000·00

4. Cost of Production Per Year

Total recurring expenditure	7,64,040·00
Depreciation on Machinery @ 10 %	1,70,00·00
Depreciation on dies/moulds @ 25 %	3,750·00
Depreciation on office equipment @ 20%	1,200·00
Interest on total investment @ 15%	57,700·00
	8,33,690·00

5. Turn Over Per Year.

Bottle caps (Thermosets (8,00,000 pcs. @ 0·20	1,60,000·00
Bottle caps (Thermoplastic 10,00,000 pcs @ 0·14	1,40,000·00
Set of torch case 2,70,000 sets @ 2·50	6,75,000·00
Total	9,75,000·00

6. Net Profit before taxation 9,75,000—

8,33,690-	1,41,310·00
Say-	1,41,000·00

7. Rate of return 33%

8. Break even point 51%

Addresses of Raw Material Manufacturers

1. M/s. Indian Plastic Ltd., Chemical Division, Palsan Bridge, Kandivli, Bombay-67.
2. M/s. Nuchem Plastic Ltd., 54, Indl. Area, Faridabad.
3. M/s. Tipco Ltd., Raj Bahadur Mansion, Hamam St. Bombay.

4. M/s. Bakelite India (P) Ltd., 1 Tolstoy Lane, New Delhi.
5. M/s. Allied Resins & Chemical Ltd., 10 Elgen Road, Calcutta.
6. M/s. Indian Petrochemicals Corporation Ltd., P. O. Jawahar Nagar, Vadodra (Gujarat).
7. M/s. Polyolefin Industries Ltd, Neivellie House, Currimbhoy Rd., Ballard Estate, Bombay-1.

Addresses of Machinery Suppliers

1. M/s. K. B. Hydraulic Engg. Works, 1C/64, Nissan Huts, N. I. T., Faridabad.
2. M/s. Nuchem Plastic Ltd., 20/6 Mathura Road, Ballabhgarh.

3. M/s. Presswel Industries, BP 2A/10, Gandhi Chowk, Faridabad.
4. M/s. Niranjana Plastics, 19/7, Boatwala Building, Sitla Devi Temple Road, Mahim, Bombay-16 DD.
5. M/s. Indian Hydraulic Inds., 70 Najafgarh Road, New Delhi.
6. M/s. Plastic & Machine Manufacturing Co. Pvt. Ltd., Ghorwadi, 2nd Cross Lane, L. G. Road, Mahim, Bombay-16.
7. M/s. Bakubhai Ambalal Pvt. Ltd., Shanti Sadan, Mirzapur Road, Ahmedabad.

(Reserved items Sl. Nos. 151 & 152.)



I. Introduction

Buttons are the essential requirements for all the dresses and garments used by every society. With the rise in the standard of living in the country there has been a steady growth in readymade garments industry resulting in more demand for buttons. Establishment of a large number of export oriented readymade garment units and increased domestic demand of uniforms/dresses for armed forces, police, school children has further caused additional demand for the buttons. Buttons are also required in every home for replacement and repair of dresses and garments.

In olden days Buttons have been made from Wood, Metal and various other conventional materials. However today, due to certain inherent advantages, plastic materials have completely replaced the other conventional materials. Availability in attractive colours, ease of fabrication to desired shape & size, light weight, anti corrosive characteristics, have made plastic buttons a favourite choice of garment designers. Ease in matching the shade of buttons with the textiles, versatility in designs to meet the requirements of changing fashion and comparatively lower cost have further added to the popularity of plastic buttons.

Plastic buttons are mainly manufactured from polyester sheets or acrylic sheets by die punching technique and from urea-formaldehyde molding powder by compression molding technique. The present scheme envisages for manufacture of acrylic sheet and urea formaldehyde buttons. The raw material as well as the machines and equipment for the manufacture of both acrylic and UF buttons are indigenously available.

II. Technical Aspects

(a) Process Outline

Acrylic Buttons

Process for making of buttons from acrylic sheets is essentially die punching technique and consists of following operations.

- Cutting of acrylic sheets to rough shaped buttons.
- Cutting to required size & shape
- Forming of designs on the front surface

- Drilling of holes
- Polishing of button
- Packing

Urea-formaldehyde Buttons

The moulding powder is first converted into tablets of suitable size and weight by means of tableting machine. These tablets are pre-heated in an oven and thereafter compression moulded into buttons by a semi-automatic compression moulding machine. The moulded buttons are buffed, if necessary, and then placked.

(b) Quality specifications

IS-8543 (Part XIII/Sec. I)—1977—Thermosetting buttons.

Acrylic buttons are manufactured as per prevailing trends of the market.

(c) Production Capacity

	Qty/Year	Value (Rs.)
(i) Acrylic Buttons	2,88,000 gross	} 6.14 lacs.
(ii) Urea-formaldehyde Buttons	96,000 gross	

III. Financial Aspects

(i) Land and Building

Plot area	200 sq. metre	Rented.
Built-up area	120 sq. metre	
(details given below)		
Factory shed	100 sq. metre	
Office shed	20 sq. metre	

(ii) Plant and Machinery

(a) Acrylic buttons section

S. No. (1)	Description (2)	Number (3)	Price (Rs.) (4)
	Sheet cutting machine	2	} 30,000.00
	Drilling machine	2	
	Hole master machine	3	
	Grinding machine	1	
	Electric Motor of 2 HP	1	

(b) Urea-formaldehyde Buttons section

Tableting machine	10,000.00
power operated	
Semi-automatic Compression	50,000.00
moulding machine with working pressure of 50 M. ton size of table 16"×18" fitted with 10 HP motor and other accessories	

(1)	(2)	(3)	(4)
Heating oven 3' x 4' x 4'			4,000.00
Polishing Barrels wooden, Hexagonal shape fitted with driving motor	4		2,000.00
(c) Dies & Moulds			8,000.00
(d) Testing Equipment			
Weighing balance, Calipers, gauges etc.			1,000.00
(e) Electrification and Installation @10% of machine & equipment			9,400.00
(f) Office equipment viz. Almirah, table, chairs, small-size type-writer etc.			6,000.00
Total fixed capital :			1,20,400.00

2. Working Capital (Per month)

(i) Personnel

Administrative Staff

Accountant-cum-Storekeeper	1	500	500.00
Salesman	2	500	1,000.00
Chowkidar	2	200	400.00
Technical staff			
Production Supervisor	2	400	800.00
Skilled workers	3	300	900.00
Unskilled workers	3	200	600.00

4,200.00

Perquisites @15% of Salaries

630.0

Total 4,830.00

(ii) Raw Materials

	Qty.	Rate	Value (Rs.)
1. Pearlised Acrylic sheets	540 kgs.	@28 kgs.	15,120.00
2. Urea-formaldehyde moulding powder	1 MT	@15 kgs.	15,000.00
3. Card-board Boxes	7500 pcs	@0.10 pack	750.00
			30,870.00

(iii) Utilities (Per month)

Power 3000 KWH @0.30 per unit		900.00
Water 50 kilo litres @0.70 kilo litres		35.00
		935.00

(iv) Other Contingent expenses (Per month)

Rent	1,200.00
Postage & Stationery	100.00
Consumable store	50.00
Repairs & Maintenance	200.00
Transport charges	100.00
Miscellaneous Expenditure	250.00
	1,900.00

v) Total recurring expenditure (Per month)

Personnel	4,830.00
Raw materials	30,870.00
Utilities	935.00
Contingent expenses	1,900.00
Total	38,535.00

Total working capital (for 3 months) 1,15,605.00

3. Total Capital Investment

(i) Fixed capital	1,20,400.00
(ii) Working Capital	1,15,605.00
	2,36,005.00

4. Cost of Production (Per year)

Total recurring cost	4,62,420.00
Depreciation on plant & machinery @10%	10,500.00
Depreciation on dies & moulds @25%	2,500.00
Depreciation on office equipment @ 20%	1,500.00
Interest on capital @15%	35,400.0
Total :	5,12,320.00

5. Turn over (Per year)

	Qty.	Value
Acrylic Buttons	288000 gross	3,74,400.00
	@1.30/gross	
Urea-formaldehyde buttons	96,000 gross	2,40,000.00
	@2.50/- gross	
Acrylic sheet scrap	1200 kg	18,000.00
	@15/kg	
		6,32,400.00

6. Profit (Before taxation)

1,20,080.00

7. Rate of Return 43.25

8. Break even Point 48%

9. Addresses of suppliers of plant and machinery

(a) Acrylic sheet Button Plant

1. M/s Bhawana Engg. Works
Regujay Plot, Jamnagar (Gujarat)
2. M/s. Associated India Machine Tools
3. Shriram Building, Jawaharnagar
Near University Campus, Delhi-7.

(b) Urea-formaldehyde Button m/cs

1. M/s K.B. Hydraulic Engg. Works
10/64 Nissan Huts, NIT, Faridabad.
2. M/s Presswell Industries
BP 2A/10 Gandhi Chowk, Faridabad.
3. M/s Plastics Machine Manufacturing Co.
Churiwal Lane, Ind Gross L.G. Road
Goregaon, Bombay-62
(East)

Addresses of Raw materials

1. M/s Nuchem Plastics Ltd.
NIT, Faridabad.
2. M/s Indian Plastics Ltd., Chemical division
Polsan Bridge, Kandivli Bombay-67
3. M/s Rekha Industries
300, Okhla Industrial Estate, New Delhi.
4. M/s Fancy Plastic Moulders
104A, Phase II, Mayapuri Industrial Area,
New Delhi-27
5. M/s Crystic Resin India, Ltd.,
54, NIT, Faridabad (Haryana)
(Reserved item Sl. No. 144)

I. Introduction

The use of polythene in the manufacture of 'Squeeze to-use' collapsible tubes is increasing rapidly in overseas market. Polythene collapsible tubes are already in general use for packaging wide range of products which include shampoos, cosmetics, creams, lotions, floor polishes and shoe polishes, household detergent preparations, car cleaners, pigments, dyestuffs and artist colours, lubricants, food stuffs etc. The popularity achieved by the plastic collapsible tubes can be attributed due to the fact that these are extremely tough, unbreakable, durable, transparent to opaque, light weight and are less expensive than conventional metal systems.

There are various methods by which polythene collapsible tubes can be manufactured. One is by extruding in the form of a continuous hose like tubing which is then cut to desired length. In another process injection moulded heads are then joined to the tube. Another conventional method practised for production of collapsible tube is blow moulding technique. The present scheme is based on press blower-moulding machine which produces one piece of non welded plastic tube with injection moulding head and blow moulded body.

The raw material commonly used for the manufacture of collapsible tubes is low density polythene, although HDPE and polypropylene are reported to have been used. Methods of decorating include lacquering, offset printing, screen printing and hot stamp foil printing. Filling is normally done automatically through the bottom of tube, the filling equipment being similar to those used for metal collapsible tubes. The bottom of the tube is then sealed by heat sealing.

It is important to mention here that all volatile solvents, flavouring oils, perfumes, oxygen containing materials may permeate through plastic layer to a certain extent in case of plastic collapsible tubes. Epoxy, PVDC, internally or externally coating have generally been used to provide additional barrier which eliminates the risk of evaporation of contents and also prevents losses of odour. Tubes have inside metallic foil to provide additional barrier, is a recent innovation in the plastic collapsible tubes.

The present scheme has been based on imported press blower moulder machine. The raw materials are however indigenously available.

II. Technical aspects

(a) Process outline

The granules are fed in the hopper of automatic press blower moulding machine. The granules are heated in three heating zones, and the plasticised stock is then transferred to nozzle lead which, is also kept hot. The amount of plastic stock required for tube is then injected through a ring nozzle against the injection mould holding the tube head and the thread mould. The injection mould with the formed tube head then moves upward and so draws a hose with uniform wall, thickness of plastic melt fed from ring nozzle. This tube is then blown into a water cooled mould, the inner surface of which corresponds to the desired finished shape of the tube. A gripper device takes the cooled tubes out of the mould and they are then fed by a tipper to a cutting unit. Here the bottom surplus is removed and the tube trimmed to the finished.

Another device places the tubes on rotating mandrels on an indexing turret, ready for printing. The tubes are then made to pass through a high tension field pretreatment, they pass the printing stations for three colour unprints and are over lacquered at a fourth station. Following this treatment, the tubes are then carried by a chain conveyor to the counter flow hot air dryer, from where they immerse ready for filling.

(b) Quality Specifications.

No specific Indian Standards are available on plastic collapsible tubes and these have to be manufactured as per customers specifications. However, the sizes of tubes which can be manufactured with the proposed machine are as under:

Minimum tube size—19mm dia—100 mm length
Maximum tube size—35mm dia—160 mm D. length 352

(c) Production Capacity

- (i) Quantity—21,60,000 Nos.
- (ii) Value—12,90,000 Rs.

III. Financial Aspects

1. Fixed Capital

(i) Land & Building	Rented.
Land	200 sq. meter
Built up area	150 sq. meter

(ii) Machinery and equipment

Production unit

Fully automatic mechanically controlled tube moulding press blower machine, complete with pretreatment and 3 colour printing unit, lacquering unit, dryer and built in switch panel for all operations and controls including the addition set of moulds.

5,00,000

--Heat sealing machine, semi-automatic	5,000
--Vertical hydraulically operated 20Z injection moulding machine	15,000
--Over head water tank alongwith pump for recycling of water	3,000

(b) Maintenance unit

Small hand tools, oiling and greasing equipment including spares of press blower	12,000
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(c) Testing & quality control

Weighing balance (Chemical), micrometer, callipers, drop test arrangement for impact testing etc.	10,000
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Electrification & installation charges	52,000
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Cost of office equipment & furniture	8,000
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Total Fixed Capital 6,05,000

2. Working Capital

(i) Personnel

Administrative staff--

Manager/Production Engineer	1	1,000
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Accountant Clerk/Storeskeeper	1	500
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Salesman	1	500
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Peon/Chokidar	2	400
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Technical--

Skilled workers	3	1,200
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Unskilled workers	4	800
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4,400

Perquisites @ 15% of salaries	660
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Total : 5,060

(ii) Raw Materials

Polythene of suitable grade for collapsible tubes 3 MT @ Rs. 14 kg.	42,000
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High impact polystyrene 0.9 MT @ Rs. 18 kg.	16,200
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Printing ink and lacquers	1,000
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Packing material viz. polythene bags and paper cartons	800
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60,000

(iii) Utilities

Power 4000 KWH @ Rs. 0.40 /KWH	1,600
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Water 100 KL @ Re. 1/KL	100
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17,00

(iv) Other contingent expenses

Maintenance & Repairs	500
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Advertisement & Publicity	500
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Transport & Travelling	200
------------------------	-----

Postage & stationery	200
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Rent	1,500
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Miscellaneous expenses	100
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3,000

(v) Total recurring expenses per month 69,760

(vi) Working Capital for 2 months 1,39,520

3. Total Capital Investment

Fixed Capital	6,05,000
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Working Capital	1,39,520
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Total 7,44,520

Say 7,45,000

4. Cost of production per year

Total recurring expenditure	8,37,120
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Depreciation on machinery & equipment @ 10%	59,700
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Depreciation on office equipment @ 20%	1,600
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Interest on total investment @ 15%	1,11,750
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Total 10,10,170

5. Sales turn-over

Plastic collapsible tubes of assorted sizes with plastic caps.	21,60,000 @ Re. 0.60 /tube	12,96,000
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6. Net profit per year (5-4) 12,96,000-10,10,170 = 2,85,830.00

7. Rate of Return 38%

8. Break-even point 44%

Addresses of machine manufacturers

M/s. Ossberger-Tubbinen Fabrik—Abt Kunsts Hoffmaschinen
8832, Weissen BURG/BAZERN
P.O. Box 425,
West Germany.

Addresses of raw material suppliers

1. M/s. Indian Petrochemicals Corporation Ltd.
Jawahar Nagar,
Vadodara (Gujarat).

2. M/s. Alkali & Chemical Corporation of India Ltd.
P.O. Box No. 310, Crecent House, Ballard Estate,
Bombay-1.

3. M/s. Union Carbide (India) Ltd.,
15, Mathew Road,
Bombay-400004.

(Reserved item Sl. No. 138)

I. Introduction

Rain Coats are manufactured from a variety of waterproof material viz. cotton/synthetic fabrics, waterproof textiles and plastic sheets. However, the use of plastic sheets is gaining fast popularity over the conventional material due to a variety of its inherent advantages such as availability in fascinating colours, light weight, ease of fabrication and lower cost compared to other waterproof fabrics. All these properties make plastic rain coats an ideal choice for daily wear mainly for school children & ladies.

Rain Coats from plastic sheets are manufactured mainly by heat sealing process. Due to ease of printability beautiful designs, writeups can be printed to impart added attraction. Various designs and shapes, can be prepared by sealing the different coloured sheets together. Elastic tapes, buttons, and zips can be easily used in the plastic sheet fabrication of rain coats.

Main machines used in process are heat sealing machines and these are indigenously available in the country. The raw materials i.e., plastics sheets, are also indigenously available.

In addition to rain coats, the proposed unit can also take up the manufacture of a wide variety of other thermowelded products viz. shopping bags, diaries & purses, filecovers & folders and other advertisement materials. As there is an immense scope for diversification of production in thermowelding process with out any additional investment a number of innovative products in various shapes and design both for consumer utility as well as advertisement and decoration, can be easily manufactured within the proposed set up. However, keeping in view the very wide product spectrum, the profitability in the project report has been calculated on the basis of rain coats only.

II. Technical aspects

(a) Process Outline

PVC sheet is cut as per pattern, size & design of the rain coat. The different parts are then thermowelded as per pattern, Zips, buttons and elastic tapes are also fixed by thermowelding and then decorative designs, paints, labels etc. are placed. Similarly other products can be fabri-

cated by heat sealing of plastic sheet pieces already cut as per design and pattern.

(b) Quality specifications

There are no standards specification for plastic rain coats etc. and these need to designed keeping in view the market trends and consumer specification.

(c) Production Capacity

- | | |
|----------------|-----------------------------|
| (i) Quantity : | 24,000 pieces of rain coats |
| (ii) Value : | Rs. 6,24,000 |

III. Financial Aspect :

1. Fixed Capital :

Land & Building		(Rented)
Plot Area	150 sq. meter	
Covered Area	100 sq. meter	Rs. 1000

Machines & Equipment :

—High frequency Welding machine 100 Watts.	2 Nos.	Rs. 22,000
—Cutting table 4' x 10	4 „	4,000
—Measuring/cutting equipment & hand tools		4,000
—Screen printing machine/embossing machine		2,500
—Installation & electric fitting charges @10% of the cost of machine		3,300
—Office equipment & furniture		5,000
—Total Fixed Capital		40,800
Say :		41,000

2. Working Capital (per month)

(i) Personnel

Administrative Staff

Accountant clerk/stores keeper	1 No.	500
Salesman	1 „	400
Watchman	1 „	200

Technical Staff.

Foreman/master cutter	1 „	500
Skilled worker	2 „	600
Unskilled worker	2 „	400

2600

Perquisites @15% of total salaries

330

Total

2,930

(ii) Raw Materials

—PVC sheet 54" width and 0.15 to 0.2 mm thick 6,000 meter @ Rs.5/ meter	30,000
—Buttons, zips, elastic tapes printing ink, stamping foils & packing material	10,000
	40,000

(iii) Utilities

Power	1000 KWH	@ 30 paisa per KWH	300.00
Water	50 KL	@ Re 1 per KL	50.00

350.00

(iv) Other Contingent Expenses :

Postage & Stationary	100.00
Repair & maintenance	100.00
Consumable Stores	50.00
Transport charges	200.00
Advertisement & publicity	250.00
Miscellaneous expenses	100.00
Rent	1,000.00

(v) Total recurring expenditure (per month)

Personnel	2,930.00
Raw material	40,000.00
Utilities	350.00
Contingent expenses	
Rent	1,000.00
Total Working Capital	45,080.00

Working capital requirement for 2 months

3. Capital Investment

Fixed Capital	41,000
Working Capital	90,160
	1,30,160.00
Say :	1,30,000.00

4. Cost of production (per year)

Total recurring expenditure	5,40,960.00
Depreciation on machines & equipment @ 10%	3,250.00
Depreciation on office equip. @ 20%	1,000.00
Interest on total investment	20,500.00
	5,65,710.00
Say :	5,66,000.00

5. Sales turn over

Item	Quantity	Rate	Value
Rain Coats	24,000	@ Rs. 26/-	6,24,000.00

6. Net profit 58,000

(before income tax)

7. Rate of return 44.6%

8. Break evenpoint 49%

9. Names and Addresses of machine suppliers

M/s. Hindco Pvt. Ltd.,
opera House, Bombay-4.

M/s. Monga Electronics Pvt. Ltd.,
Post Box No. 7617, Malad (W),
Bombay-400064.

M/s. Shegal Brothers Enggrs.,
2505, Teliwara, Delhi-6.

M/s. Noval Engg. (P) Ltd., Sambana Chamber,
Sir P. Mehta Road, Post Box 881,
Bombay-1 BR.

10. Names and Addresses of Raw material suppliers :

M/s. Bohr Industries Ltd.,
Cadel Road, Bombay-28.

M/s. Caprihans (India) Pvt. Ltd.,
Janam Bhumi Chambers,
Ballard Estate, Fort Bombay-1.

M/s. Calico Chemicals & Plastics Div.
Anik Chamber Bombay-74-AS.

M/s. Pearl Polymers Pvt. Ltd.,
27A, Nazafgarh Road, New Delhi-15.

M/s. Fancy Plastic Moulders,
104-A, Phase II, Mayapuri Indl. Area,
New Delhi-27.

M/s. Govind Plastics,
8/41, Kirti Nagar Indl. Area,
New Delhi-15.

M/s. Jayshree Plastics,
P-27, Jayatish Ray Road, Calcutta-33.

M/s. Poly Products,
30/9, Shakti Nagar, Delhi-15.

M/s. Sajben Plastics Films (P) Ltd.,
5/28, Kirti Nagar Indl. Area,
New Delhi-15.

(Reserved item Sl. Nos. 151&154)

I. Introduction

Commercial unsaturated polyester resins are comprised of the following essential ingredients : a linear polyester resin, a crosslinking monomer and inhibitor to retard crosslinking until the resin is to be used by the fabricator. The linear polyester is typically the condensation product of an unsaturated dibasic acid as the source of ethylenic unsaturation and a glycol. Usually a saturated dibasic acid is employed with the unsaturated acid to modify the degree of unsaturation and thereby the reactivity of the resulting resin. The unsaturated intermediates are commonly maleic anhydride and fumaric acid; the saturated acid are phthalic anhydride, isophthalic acid and adipic acid; and the glycols are propylene glycol, ethyleneglycol, diethylene glycol and dipropylene glycol. Depending on envisaged end application various grades of polyester resins are prepared by varying the reactant composition and reaction conditions.

The usual crosslinking monomers are styrene, vinyl toluene, methyl methacrylate, ϵ -methyl styrene and diallyl phthalate. Conventional inhibitors are hydroquinone and t-butyl catechol. However, the most commonly used crosslinking agent is styrene monomer.

These basic resins can be polymerized into infusible materials by the action of free radicals. The usual free radical source is a peroxide catalyst. Free radicals are formed by thermal decomposition of the catalyst, as in press molding applications. Metallic soaps and/or tertiary amines are added to polyesters to act as catalyst activators at room temperature, the combinations of methyl ethyl keton peroxide and cobalt octate, and benzoyl peroxide and dimethyl aniline, being commonly employed.

Resin manufacturers make many modifications of the basic resins before shipping them to their customers. They may incorporate thixotropic agents such as silica. Thixotropic agents permit the fabricator to apply the resin to vertical mold surfaces without risk of drainage prior to gellation. For open mold applications or coatings, paraffin wax may be added to minimize inhibition of the cure of surfaces exposed to air. Ultraviolet absorbers such as benzophenones and

benzotriazols protect the cured polyesters from discoloration caused by sunlight.

Unsaturated polyester resins are the basic raw materials for the manufacture of GRP products which find application in almost every field of operation such as transport, construction, civil engineering, marine engineering, chemical and electrical engineering etc. Besides, these resins are used for the manufacture of buttons, coating and paints, sheets and panels and for casting applications.

In view of the large number of units coming up for the manufacture of GRP products the demand for polyester resin is likely to grow manifold. The present scheme has been drawn for the manufacture of various grades of polyester resins.

II. Technical aspects

(a) Process outline

There is a two step batch process for manufacture of polyester resin. First of all there is a condensation reaction between dibasic acids and dialcohol in an inert gas atmosphere. Next to it is blending of polyester resin with monomer. Condensation is carried out in a pressure autoclave under inert atmosphere, until a low acid number is obtained. The resulting linear copolymer is cooled and blended with monomer, usually styrene at temperature between 120 to 150° F. Monomer and polyester blend also contains an inhibitor to prevent premature gelatin and to provide storage stability.

(b) Quality specifications

There is no IS specification, However, there exist various grades of polyester resin such as general purpose, chemical resistant, heat-resistant, flexible etc. for different end applications.

(c) Production capacity

Quantity—300Mt./year

Value—Rs. 90,00,000.00

III. Financial Aspects

1. Fixed capital

(i) Land and Building

Land—500 sq. meter.

Built up area—300 sq. meter

(details as under)

Factory shed.

office

—260 sq. meter

—40 sq. meter.

Rented.

(i) Machinery and equipment

	Rs.
1. AISI 416 stainless steel reactor, 1500 litres capacity, with internal heating coils fitted with vapour duct, reflux condensers receiver, temperature recorder, pressure gauges, etc. Provision of flash bottom valve with connection to thinning vessel, along with vacuum system and stirrer & motor.	1 no. 3,50,000.00
2. Stainless steel Resin mixing reactor, jacketted, cap. 200 litres fitted with stirrer & motor.	1 1,25,000.00
3. Styrene storage stainless steel lined tank 12000 litre cap.	1 48,000.00
4. Closed system thermic fluid heating system with heat cap. of 1,00,000 K cal/hr	1 1,50,000.00
5. Nitrogen cylinder and arrangement for injection of nitrogen gas into reactor	1 2,000.00
6. Overhead water tank, circulation pumps chainpully block system for feeding of raw materials, Filtering arrangement for resins.	25,000.00
	7,00,000.00
(iii) Electrification and installation @ 10% of machines value.	70,000.00
(iv) Development & Technical Service laboratory equipped with glass apparatus & equipment and testing facilities for determination of viscosity, geltime, hardening, time vicat softening, impact and tensile strength of FRP products and fire fighting equipment. Also equipped experimental Small pressure autoclave for developmental works.	1,50,000.00
(v) Office equipment such as almirah fans tables, typewriter etc. & working tables for laboratory	20,000.00
Total fixed cost.	9,40,000.00

2. Working capital (per month)**(i) Personnel****Administrative staff**

	Rs.
1. Production Manager	1 No. 1,500.00
2. Sales representative	2 Nos. 1,600.00
3. Accountant/store keeper	1 No. 800.00
4. Steno cum-typist	1 No. 500.00
5. Peon	2 Nos. 400.00

(Technical staff)

1. Polymer chemist	1 No. 1,200.00
2. Lab. chemist	1 No. 700.00
3. Skilled worker	4 Nos. 1,200.00
4. Semi-skilled worker	4 Nos. 800.00

Total :	8,700.00
(1) perquisites @ 15% of salaries	1,305.00
Total	10,005.00

(ii) Raw Material including packing expenses			Value (Rs.)
Phthalic anhydride	6975 Kg @ Rs. 15/- per kg		1,04,625.00
Maleic anhydride	4600 kg @Rs. 14.00 per kg		64,400.00
Propylene glycol	7575 kg @Rs. 15.00 per kg		1,12,875.00
Styrene	8350 kg @Rs. 10.00 per kg		83,500.00
Hydroquinone	0.500 kg @Rs. 100.00 per kg		500.00
Nitrogen gas	25 cylinder @Rs. 50.00 per cylinder		1,250.00
Drums for packing	1000 Nos @Rs. 30.00 per drum		30,000.00
Total :			3,96,700.00

(iii) Utilities

Power—4000 kwh @Rs. 0.30 per kwh	1,200.00
Water—50 KL @Rs. 0.70 per kl	35.00
Furnace oil 7.5 KL @Rs. 1200/- per KL	9,000.00
Total	10,235.00

(iv) Other contingent expenses

Rent	3,000.00
Postage & stationery	300.00
Telephone	1,000.00
Consumable store	1,500.00
Transport & travelling	3,000.00
Advertisement & publicity	3,000.00
Misc.	3,200.00
Total :	15,000.00

(v) Total recurring expenditure per month

Say Rs. 4,32,000.00

(vi) Working capital for 3 months**3. Total capital investment**

Fixed capital	9,40,000.00
Working capital	12,96,000.00
Total	22,36,000.00

4. Cost of production per year

Total recurring expenditure	51,84,000.00
Depreciation on m/c. @ 10%	92,000.00
Depreciation on office equipment @ 20%	4,000.00
Interest on capital investment @ 15%	3,35,400.00
Total	56,15,400.00

5. Total turn over (per year)

Polyester resin 300 MT @Rs. 23,000 Mt	Rs.
6. Profit before taxation	69,00,000-00
7. Rate of return	12,84,000-00
8. Break even point	55%
	33%

Addresses of machinery suppliers

1. M/s. Ganson pvt. Ltd.,
677, Himalaya House
23, Kasturba Gandhi Marg, New Delhi
2. M/s. Wanson India (Pvt.) Ltd.,
22, Mahatma Gandhi Marg,
Lajpat Nagar, New Delhi-24.
3. M/s. Blendencole, Rang Udyan
Mahim, Bombay.

Addresses of suppliers of raw material

1. M/s. Herdallia chemicals Ltd.
Air India Building, Nariman Point,
Bombay.
2. M/s. Durgapur chemicals Ltd.,
Durgapur West Bengal
3. M/s. Adarsh Chemicals & fertilisers Ltd.
Surat. (Udhna)
4. M/s. Hindustan Polymer Ltd.
Kanchanjunga building
Bara Khamba Road.
New Delhi-1.
5. M/s. Polychem Ltd.,
Swami Vivekanand Road,
Goregon, Bombay.

Propylene Glycol—to be imported.

(Reserved item Sl. No. 250)

I. Introduction

In India plastic buttons are mainly manufactured from urea-formaldehyde materials and acrylic sheets. Acrylic sheet buttons initially have good finish and lusture but due to thermoplastic nature of acrylic materials these develop defects viz. cracks, loss of surface finish and deshaping when used in tropical conditions and subjected to repeated laundry washings. In order to manufacture high quality heat resistant buttons, polyester sheets are now extensively used in developed countries. Owing to their crosslinked structure, polyester sheet buttons are superior in quality and retain their shape, finish and lusture during constant use and are therefore preferred over conventional acrylic buttons.

Besides buttons, polyester sheets may be used for applications in bangles, decorative panels, fixtures, housing for instruments/components and various other allied applications, wherever the costing considerations permit their use. The present scheme envisages the manufacture of polyester sheets by cold centrifugal casting technique. The gelled sheets obtained from the centrifugal casting machines are straightened and cut into desired sizes before finally curing. The sheets may be manufactured either as a single layer system or multi layer system in which the base layer(s) may be supporting component and is usually plane while top layer contains the colours and designs and serves as decorative surface.

The main raw material used for the manufacture of polyester sheets is general purpose polyester resin which is indigenously manufactured in the country. The other raw material viz. catalyst, pigments etc. and technology involved is also indigenously available. Presently the polyester sheets are being manufactured with imported sheet casting machines however keeping in view the simple construction of machine, these can be easily got fabricated in the country. The present proposal is based on estimated prices of indigenous sheet casting machines.

II. Technical aspects

(a) Process outline

The important raw material for the manufacture of polyester sheet is general purpose polyester resin. Other main raw materials include

catalyst, accelerator, pigments and dyes, fillers etc. Normally methyl ethyl ketone peroxide or benzoyl peroxide are used as catalyst and cobalt naphthenate or tertiary amines are used as accelerators.

Firstly requisite amount of catalyst, accelerator, pigments, etc. are mixed thoroughly with polyester resin to obtain a homogenous mass. The mix is then transferred to centrifugal casting machine where due to rotational effect it forms a layer of uniform thickness inside the casting cylinder. During constant rotation of the casting cylinder the polyester resin gets crosslinked under the effect of heat generated due to friction. Sometimes a slight amount of external heat may be necessary for completion of gelation. The quantity of the resin mix transferred to the sheet casting machine depends on the specifications of the sheet to be constructed. When a multi layer component sheet is to be constructed firstly the base layer is charged and is kept in rotation in casting drum till it becomes tack free. Second layer or top layer is then fed to the casting machine and machine is kept in operation till both the layers are completely gelled. The gelled sheets in cylindrical form are taken out of casting drum and are straightened after cutting while still in soft state. The polyester sheets thus obtained are then brought to the cutting machine to obtain the sheet as per requirement. These sheets may be either punched in gelled state to obtain the desired shape and size of finished article or these may be completely cured for obtaining thermo-setting sheets.

(b) Quality Specification

There is no standard specification laid down for Polyester sheets and these need to be manufactured as per customer's specifications.

(c) Production Capacity

(i) Quantity	2400 Nos. of Polyester sheet of size 74 cm × 22 cm × 3 mm.
(ii) Value	Rs. 7,20,000.00

III. Financial Aspects

1. Fixed Capital

(i) Land and Building—	
Plot Area	250 Sq. meters
Covered area	200 Sq. meters

(ii) Machinery and Equipment

Production unit

		Rs.
1. Mixer—suitable for mixing the resins having mixing capacity 100 kgs., fitted with all accessories, complete with stainless steel construction	1 No.	5,000·00
2. Centrifugal machine—for the production of polyester sheets, automatic and climatized unit complete with two timers, speed variation arrangement, revolution counter, complete with special set for the climatization of the cylinder	3 Nos.	1,50,000·00
3. Sheet cutting machine, power operated, alongwith sheet straightening platform	2 Nos.	7,000·00

Maintenance unit

Such as small tools, greasing and coiling equipment	3,000·00
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Testing and quality control :

Testing laboratory equipped with instruments such as chemical Balance, micrometer, hardness tester, etc.	5,000·00
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(iii) Installation and Electrification charges @ 10% of cost of plant and machines	17,000·00
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(iv) Dies, moulds, steel sheet frames etc.	2,500·00
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(v) Office equipment	2,500·00
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Total Fixed Capital	1,92,000·00
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2. Working Capital

(i) Personnel

Administrative staff—Manager Production/Chemist	1	600·00
Accountant-cum-storekeeper	1	350·00
Salesman	1	350·00
Peon	1	200·00

Technical staff—

Skilled worker	3	900·00
Unskilled worker	3	600·00

Total	3,000·00
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Perquisites @ 15% of salaries	450·00
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Total	3,450·0
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(ii) Raw material

Polyster resin	1200 kg. @ 30/kg.	36,000·00
Pearl Essence	12 kg. @ 100/kg.	1,200·00
Catalyst	12 kg. @ 80/kg.	960·00
Accelerator	6 kg. @ 25/kg.	150·00
Packaging expenses		190·00
		38,500·00

(iii) Utilities

		Rs.
Power	700 KWH @ Rs. 0·30 per KWH	210·00
Water	130 KL @ Rs. 0·70 per KL	91·00
Total		301·00
Say		300·00

(iv) Other contingent expenses

	Rs.
Rent	2,000·00
Maintenance & Repair	450·00
Advertisement	150·00
Transport & Travelling	150·00
Printing, postage & stationery	100·00
Taxes	50·00
Total	2,600·00

(v) Total recurring expenditure per month	44,850·00
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(vi) Working Capital for 3 months	1,34,550·00
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3. Capital Investment

Fixed Capital	1,92,000·00
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Working Capital	1,34,550·00
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Total	3,26,550·00
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Say	3,26,000·00
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4. Cost of Production (per year)

Total recurring expenditure per year	5,38,200·00
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Depreciation on machinery @ 10%	18,700·00
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Depreciation on office equipment @ 20%	500·00
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Depreciation on moulds @ 25%	625·00
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Interest on Investment @ 20%	48,900·00
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Total	6,06,925·00
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Say	6,07,000·00
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5. Turn-over (per year)

Polyester sheet of size 74 cm × 220 cm × 3 mm	2400 Nos. @ 300/sheet	7,20,000·00
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6. Net profit per year (5—4) :	7,20,000·00—6,07,000·00=1,13,000·00
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7. Rate of return	38%
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8. Break-even point	48%
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Addresses of Plant and Machinery Suppliers

1. M/s. F. Bonetti & C.S.N.C.
Via Urago 1200·25030
Rudiano (Brescia), Italy.

2. M/s. Sethi Engineering Works,
Hemilton Road,
Kashmere Gate, Delhi.

Addresses of Raw Material Suppliers

1. M/s. Crystic Resin India (P) Ltd.,
19/6 Mathura Road,
Faridabad (Haryana).

2. M/s. Bakelite Hylam Pvt. Ltd.,
1, Tolstoy Lane,
New Delhi.

3. M/s. Acroplymers Pvt. Ltd.,
Khandsa Road, Gurgaon,
Haryana.

(Reserved item Sl. No. 153).

I. Introduction

Potassium silicate produced at present in the country is manufactured by conventional fusion process. It can also be manufactured by ion exchange process for which detailed work has been done by RRL Jorhat and C.S. & M. CRI, Bhavanagar. It is used as a binder in electrodes and adhesives and coating of TV tubes. It is also required to some extent in the manufacture of toilet soap and textiles. The estimated requirement of potassium silicate is 500 ton per year by the end of 1980.

II. Technical Aspects**(a) Process Outline**

The process adopted for ion exchange method is basically passing of a clear solution of sodium silicate through a resin column already treated with potassium chloride solution and getting a resultant silicate in a dilute solution. This is further concentrated to the desired specific gravity.

(b) Quality specification

There are no standard specification. It may however be made as per specification of buyers such as of Bharat Electronic Corporation.

- (c) Production capacity :
150 tons
Value—Rs. 7,12,500/-.

III. Financial aspects**(1) Fixed capital :****(i) Land and Building**

Land—500 sq. m.
Built up area for office and factory shed
300 sq. m.—Rented Rs. 2,000·00
(p.m.)

(ii) Machinery and Equipment (All Indigenous)

Particulars	Qty.	Value
(i) Resin column complete with suitable cation exchange resin capa. 2000 lts./24 hrs.	2 Nos.	Rs. 40,000·00
(ii) Evaporators, M. S. Jacketted connected with steam pipes cap. 500 lts.	2 Nos.	10,000·00
(iii) Boiler, 100 kg/hr evaporation capacity 100 PSI complete with pump motor, overhead tank, pipelines chimney etc.	1 No.	20,000·00

(iv) Misc. like weighing scales buckets, motors, fire tanks stirrers, extinguishers, etc.	Rs. 15,000·00
Electrification/installation	8,000·00
Chemical laboratory, office equipment and working tables	14,000·00
Total	1,16,000·00

(2) Working Capital :**(i) Salary and Wages (per month)**
Administrative and Office :

Accountant-cum-cashier	1	800·00
Clerk-cum-typist	1	500·00
Peon-cum-watchman	2	400·00

Technical :

Technologist	1	1,000·00
Analyst-chemist	1	800·00
Supervisor	2	1,000·00
Workers	10	2,000·00

6,500·00

Perquisites @ 15% on salaries 1,000·00

7,500·00

(ii) Raw Materials (per month) :

Sodium silicate	9 tons	9,000·00
Potassium chloride	5 tons	10,000·00
Misc. chemicals and packing materials (M.S. drums etc.)		11,000·00
		30,000·00

(iii) Utilities (per month)

Electricity 2500 KWH	700·00
Coal 10 tons	2,000·00
Water	100·00
Resin make up	200·00
	3,000·00

(iv) Other contingent Expenses per month

Rent	2,000·00
Stationery, postage, telephone	300·00
Transport	1,000·00
Advertisement & publicity	2,000·00
Consumables	200·00
Repairs and maintenance	200·00
Insurance	300·00
	6,000·00

(v) <i>Working Capital/3 months</i>	Rs. 1,39,500-00
(3) <i>Total Capital Investment</i>	2,55,500-00
(4) <i>Total production cost per year</i>	
Recurring expenses	5,58,000-00
Depreciation of machinery @ 10% p.a.	7,500-00
Depreciation of office equipment, laboratory equipment, etc. @ 20% p.a.	6,800-00
Interest on capital @ 15% p.a.	38,000-00
	6,13,300-00
(5) <i>Turnover per year</i>	
Potassium silicate 36° BC to 40° BC	7,12,500-00*
(6) <i>Net profit (before taxation)</i>	99,200-00
(7) <i>Return</i>	38%
(8) <i>B.E.P.</i>	51%

*Electronic grade can fetch even a much higher price.

List of raw material suppliers :

Sodium Silicate

1. Manufacturers of silicates (all over the India).

2. All India Silicate Manufacturer's Association, S. N. Banerjee Road, Calcutta.

Potassium Chloride

1. Mahanto Enterprises, Shrirampur, Distt. Hooghly.
2. Progressive Chemical Industries, Chrystopher Road, Calcutta-14.

List of machinery suppliers

Boiler

1. Texena Co., Bilghoriah Dr., 24-Parganas, West Bengal.
2. Wansons (India) Pvt. Ltd., Delhi, Bombay, Calcutta.
3. Batlibouy & Co., Calcutta, Delhi, Bombay.

Ion Bexchange Resin Plant

1. Iono Chem. Ltd., Behala, Calcutta.
2. Jeolite India Ltd., 375, Netaji Subhas Chandra Bose Road, Calcutta-43.
3. Ion-Exchange (India) Ltd., Calcutta, Delhi, Bombay.

(Reserved item Sl. No. 324).

I. Introduction

PVC/Polythene flexible pipes find extensive applications in agriculture, industry, mining and shipping sectors etc. for conveying of fluids. With the increasing emphasis on mechanised forming and faster rate of industrial development the demand of these hoses is likely to grow quite substantially in future. Moreover, the item being of nearly consumable type there would be recurring demand also for replacement in addition to new requirements.

PVC/PE hoses can be either single walled type, manufactured by straight extrusion or of reinforced walled structure (Heliflex) manufactured by co-extrusion system. These hoses are resistant to most of the chemical soils and acids etc. and are thus fast replacing conventional rubber hoses in many sectors. In addition to this PVC/PE hose offer certain inherent advantages viz. light weight, longer life, higher flexibility, uniformity in inner diameter, improved weather resistance, which make them preferred over rubber pipes in a number of applications. The technology machines as well as the raw materials for the manufacture of these hoses are indigenously available.

II. Technical Aspects

(a) Process Outlines

The process of manufacture for PVC reinforced hoses consists of the following operations:

1. Compounding of PVC—PVC resin along with other compounding ingredients viz. plasticizer, stabiliser, filler, lubricant etc. is mixed in a high speed mixing unit. After colling the PVC compound mix is converted in the form of pallets with the help of an extruder.
2. Extrusion of Pipe—Two different type of PVC compounds, one soft and another of rigid type are extruded from two different extruders. Both the extruded sections are taken over rotating former so that these are fused together and form in a shape of pipe of the desired diameter. The pipe is then passed through a water cooling tank. The desired length of pipes are cut and packed in gunny bags cloth/paper.

(b) Quality Specifications :

As per customer's specifications.

(c) Production Capacity (Per annum on single shift working) :

- | | |
|-------------------|--|
| (i) Quantity | 145 MT of PVC heliflex hoses in various sizes. |
| (ii) Value | Rs. 20,30,000.00 |
| (iv) Motive Power | 40 H.P. |

(d) Financial Aspects

(i) Fixed Capital

	Rented
(i) Land and Building	
Land	300 sq. meter
Built up area (details as under)	250 sq. meter
(a) Working shed	250 sq. meter
(b) Office accommodation	20 sq. meter.

(iv) Other contingent expenses (per month)

(ii) Plant and Machinery

(a) Compounding manufacturing unit :

High speed mixer—capacity 25 kg. batch size, stainless steel lining, air tight opening & closing system fitted on steel frame with one motor of 10 H. P. complete with cooling trays. 1 No.

Extruder—65 mm fitted on steel frame with worm gear made of stainless steel non-magnetic chain drive system with gear box & one motor of 7.5 H.P. 1 No

Control Panel—containing line indicators thermo-couples heat, control system, starter & switches etc. 1 No.

Water Tanks—fitted with guides 1 No.

Pelletizer—fitted with one motor of 1 H.P. with special cutting edge blades with starter switch etc. 1 No.

Cost (a) 55,000.00

(b) Heliflex Hoses manufacturing unit :

Rigid core manufacturing extrusion unit—fitted on steel frame with worm made of stainless steel with radicon brand gear box chain-drive system with motor of 7.5 H.P. & control panel 1 No.

Soft Core manufacturing extrusion unit—65 mm. size fitted on steel frame with screw made of stainless steel with gear box and one motor of 7.5 H.P. and special arrangement fitted with sheels for adjustment to attachment with 50 mm extruder and control panel 1 No.

50 mm

Die Head—Fitted with noth of extruder driving attachment for sizing for pipe with DC rectifier, control system
Water Tanks—30 meters in length with guide system complete with steel stand & tanks.

3 sets of die of 3" and 6" sizes :

Cost (b)	Rs.
	8-5,000.00
Total (ii)	1,40,000.00
(iii) Testing & quality control equipment such as micrometer, avery type balance and gauge etc. of value	3,000.00
(iv) Electrification & installation charges	12,000.00
(v) Cost of office equipment	5,000.00
Total non-recurring expenditure (i to v)	1,60,000.00

2. Working Capital (per month)

(i) Personnel :

(a) Technical Staff :

Production Supervisor	1 No. @ 1,000.00	1,000.00
Mechanic-cum-Electrician	1 No. @ 400.00	400.00
Skilled Workers	2 Nos. @ 400.00	800.00
Unskilled Workers	5 Nos. 200.00	1,000.00

(b) Administrative staff :

Accountant/Storekeeper	1 No. @ 500.00	500.00
Typist-cum-clerk	1 No. @ 300.00	300.00
Peon/Chowkidar	1 No. @ 200.00	200.00
Total (i)		4,200.00

(ii) Perquisites : (@ 15% of salaries)

(iii) Raw Materials :

PVC Resin	8875 Kg. @ Rs. per kg.	88,750.00
DOP	2250 kg. @ Rs. 12 per kg.	27,000.00
CPW	875 kgs. @ Rs. 5 per kg.	4,375.00
Stabilizer	375 kgs. @ Rs. 20 per kg.	7,500.00
Lubricants & pigments	125 kgs. @ Rs. 20 per kg.	2,500.00
Total (iii)		1,30,125.00

(iv) Utilities :

Power	300 KWH @ Rs. 0.30 per KWH	900.00
Water	285 KL @ Rs. 0.07 per KL	200.00
Total (iv)		1,100.00

(v) Other Contingent Expenses :

Rent	2,500.00
Postage & stationery	350.00
Telephone	300.00
Repair & maintenance	245.00
Transport	900.00
Advertisement & publicity	500.00
Taxes	250.00
Packaging	900.00
Total (v)	5,945.00

(vi) Total Recurring Expenditure per month : (Rs.)

Staff and labour	4,200.00
Perquisites	630.00
Raw materials	1,30,125.00
Utilities	1,100.00
Other contingent expenses	5,945.00
Total (vi)	1,42,000.00

i.e. working capital for one month Rs. 1,42,000.00

3. Total Investment :

Fixed Capital	1,60,000.00
Working Capital for 3 months	4,26,000.00
Total (3)	5,86,000.00

4. Total Cost of Production (per year) :

Total recurring expenditure	17,04,000.00
Depreciation on plant & machinery @ 10%	15,500.00
Depreciation on office equipment @ 20%	1,000.00
Interest on total investment @ 15%	87,900.00
Total (4)	18,08,400.00

5. Turn-Over (per year) :

P.V.C. Heliflex Hoses 145 M.T. @ Rs. 14,000 per M.T.	20,30,000.00
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6. Net Profit Per Year :

Rs. 20,30,000.00—Rs. 18,08,400.00=Rs. 2,21,600.00

7. Net Profit Ratio :

$$\frac{\text{Net profit per year} \times 100}{\text{Turnover per year}} = \frac{2,21,600 \times 100}{20,30,000} = 10.8\%$$

8. Rate of Return :

$$\frac{\text{Net Profit per year} \times 100}{\text{Total Investment}} = \frac{2,21,600 \times 100}{5,86,000} = 37.6\%$$

9 Break-even Point :

Fixed Costs	1,74,120.00
Net Profit per year	2,21,600.00
$\text{Fixed Cost} \times 100$	
BEP	$\frac{\text{Fixed Cost} + \text{Net Profit}}{1,74,120 \times 100}$
	3,95,720
	= 44 %

10. Names and addresses of Machinery Suppliers :

1. M/s. Indian Hydraulic Industries,
70, Najafgarh Road,
New Delhi.
2. M/s. Golden Engg. Industries,
87997, Shidipura Cross, Rani Jhansi Road,
New Delhi-110005.
3. M/s. International Plastic Machinery Co.,
Street No. 1, Anandparbat Indl. Area,
New Delhi.
4. M/s. Marjara Plastic Industries,
Brahmapuri, Ludhiana (Punjab).
5. M/s. R. H. Windsor (India) Ltd.,
Plot E-16, U Road, Thana Indl. Estate,
Thana, Bombay.
6. M/s. Brimco Plastic Machinery Corp.,
Plot No. 55, Govt. Kandivili Indl. Estate,
Charkop, Kandivili (West), Bombay-67.

Names and Address of Raw Materials suppliers :

1. Shriram Chem. Industries,
Shrirampur Kota (Raj.).
2. National Organic Chemicals Ind. (P) Ltd.,
Sandoz House, Dr. A. Besant Road,
Worli, Bombay-18.
3. Chemplast, Dhun Bldg., 175/1,
Mount Road, Madras-2.
4. Plastic Resin & Chemicals,
Bharat Insurance Building,
15-A, Horiniaman Circle,
Bombay-1.
5. Calico Chemicals & Plastic Divn.,
Anik Chembur, Bombay-74-AS.
6. Sudershan Chemicals Inds. P. Ltd.,
162, Velleseley Road,
Poona-1.
7. Colour Chemicals Ltd.,
Ravinder Annexe, 194, Churchgate,
Redamation, Dinshaw Vacha Road,
Bombay-2.
8. Chika Ltd., Mehta Chambers,
13, Mathew Road, Bombay-4.

(Reserved item Sl. No. 140).

I. Introduction

By virtue of their certain intrinsic values of possessing the combinations of excellent properties the rigid PVC pipes are fast replacing the conventional metal pipes in many applications. Their use as electrical conduit is well established in the building construction. PVC conduits have been accepted by all the electricity boards. PVC pipes of larger diameters have gained wider acceptance for potable water supply. Their low cost, easy installation, non corrodibility, high tensile strength to withstand high fluid pressures and better durability make them ideal for the purpose. Their use in tubewell is a recent innovation. They also offer very good resistance to most of the chemicals and have excellent electrical and heat insulation properties.

Rigid PVC pipes and fittings for soil rain water and irrigation system have been produced and used in advanced countries of the world. In view of priorities attached to rural water supplies and irrigation facilities in the national planning, adequate precautions need to be taken regarding the availability of raw materials, while planning for the expansion of existing production capacity in PVC pipes.

The present scheme has been drawn for the manufacture of rigid pipes with a maximum dia of 90mm (from 20mm to 90mm) mainly used for domestic potable water supplies and rain water pipes. The scheme is based on a 65mm twin screw extruder, and the envisaged production capacity is MT of PVC pipes per annum.

II. Technical Aspects :

(a) Process outline :

Rigid or unplasticized PVC pipes are made from Poly Vinyl Chloride (PVC) which in resin form is hard and rigid material. This rigidity can be controlled by controlling the percentage of plasticizer at the time of compounding. The production of Rigid PVC pipes consists of plasticizing and homogenising PVC compound and metering through an Extruder. This hot molten PVC compound is extruded by the extruder through a circular slit. This circular slit governs the size of the pipe to be

extruded. Different dies are used for manufacturing different sizes of pipes.

The pipe thus extruded through the die is then passed through a vacuum sizing tank where the dimensions of the pipe can be accurately set. This also helps in the surface finish of the pipe. Vacuum sizing which is much more sophisticated than other types of forming operations reduces the percentage of wastage considerably.

As the pipe being extruded is rigid in form they can not be wound into coils, so an in-line motorised Cutting Device should be provided for cutting the pipes into required sizes.

Since the performance requirement for the rigid pipes are quite critical the unit should preferably be equipped with process control lab. for the preliminary testing of raw materials for ascertaining the consistency in their quality. The unit may also have arrangement for quality testing of pipes. Details of testing equipments have been given under machinery and equipment.

(b) Quality Specifications :

The following ISI Specifications are available for rigid PVC pipes.

IS-2509-1963--	Rigid non metallic conduits for electric installations
IS-4983-1968	Unplasticized PVC pipes
IS-774-1971	Flushing pipes.

(c) Production Capacity (per annum) :

(i) Quantity	144 M. Tons/year
(ii) Value	Rs. 22,32,000.00

III. Financial Aspects :

1. Fixed Capital :

(i) Land and Building—Rented.

Plot Area	400 sq. meters	}	2,400.00
Built up area	300 sq. metres		

(ii) Machinery and Equipment :

Production unit

High speed mixer, honschel type capacity 50 kgs. batch size, fitted with complete controls & with cooling arrangement	1	15,000.00
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65 mm PVC rigid pipe extrusion plant consisting of extruder (twin screw) vacuum sizing unit, cooling tank, haul off unit and cutting device. Complete with controls and motor etc.

Dies for various sizes of pipes and other desired accessories

Scrap grinder, heavy duty, fitted with motor

Overhead water tank and recycling pump units

Weighing balance 'Avery' type industrial model.

100 gms. to 5 kgs.

1 kg. to 100 kgs.

Pipe storage racks

Maintenance :

Small hand tools, greasing & oiling equipments

Testing and quality Control :

Chemical testing laboratory consisting of chemical balance, oven and equipment with testing equipments/apparatus for testing bulk density, specific gravity load/tin estimation (in ppm) & chemical resistance

Instrument laboratory equipped with testing facilities for impact measurement, compressive strength hydraulic pressure etc.

Expenditure for erection, installation & electric fittings etc. @ 10% of machinery and equipment cost

Office equipment and furniture

Total Fixed Capital

2. Working Capital :

(i) Personnel

(a) Administrative & Supervisory

Manager 1 700-00

Accountant-cum-storekeeper 1 500-00

Peon-cum-Chowkidar 2 400-00

(b) Technical

Production Chemist-cum-Supervisor 1 800-00

Skilled worker 3 1,200-00

Semi-skilled worker 3 900-00

Total 4,800-00

Perquisites @ 15% 720-00

Total 5,520-00

(ii) Raw materials

Particulars	Qty.	Rate Rs./kg.	Value Rs.
1. PVC resin	11,000 kgs	10/-kg.	1,10,000-00
2. DOP	500 kgs.	15/-kg.	7,500-00
3. Stabilizer	200 kgs.	20/-kg.	4,000-00
4. Processing Aids	100 kgs	20/-kg.	2,000-00
5. Colourant	50 kgs.	100/-kg.	5,000-00
Fiber	500 kgs.	2-5/-kg.	1,250-00
			1,29,750-00

(iii) Utilities

Power	8000 KWH @ Rs. 0-30/KWH	2,400-00
Water	150 KL @ Rs. 0-70/ KL	105-00
		2,505-00

(iv) Other contingent expenses :

1. Rent	2,000-00
2. Postage & stationery	300-00
3. Repairs & maintenance	1,500-00
4. Transport	1,000-00
5. Advertisement & Publicity	500-00
6. Phone	200-00
7. Miscellaneous	500-00
	6,000-00

(v) Total Recurring Expenses (Per month) 1,43,775-00

Say 1,44,000-00

(vi) Working Capital (for 3 months) 4,32,000-00

3. Total Capital Investment :

Fixed Capital	4,10,000-00
Working Capital	4,32,000-00
	8,42,000-00

4. Cost of Production (per year) :

Total recurring expenditure	17,28,000-00
Depreciation on plant & machinery @ 10%	36,000-00
Depreciation on dies @ 25%	2,500-00
Depreciation on office equipment @ 20%	2,400-00
Interest on Capital Investment @ 15%	1,26,300-00
	18,95,200-00
Say	18,95,000-00

5. Turn-over per year :

Rigid PVC pipes 144 M. Tons @ 18,000/- 22,32,000-00

6. Net profit per year (5-4) =Rs. 22,32,000-18,95,200-00 =Rs. 3,37,000-00

7. Rate of Return 40%

8. Break-even Point 41%

9. Name and Addresses of the Machinery Suppliers :

1. M/s. R. H. Windser (India) Ltd., Plot E-16, U Road, Thana Indl. Estate, Thana Bombay.
2. M/s. Brimco Plastic Machinery Corpn. Pvt. Ltd., Plot No. 55, Govt. Kandivli Indl. Estate, Charkop, Kandivli (West), Bombay-67.
3. M/s. Internation Plastic Machinery Comp., Street No. 1, Anandparbat Indl. Area, New Delhi.

4. M/s. Golden Engg. Inds.;
87997, Shidipura Cross,
Rani Jhansi Road, New Delhi-5.
5. M/s. Indian Hydraulic Industries,
70, Najafgarh Road, New Delhi.
6. M/s. Dhiman Engg. Works,
2535, Prem Narain Street,
Churiwalan, Delhi-6.
7. M/s. Kolsite Industries,
Post Box No. 7368,
31, Shah Indl. Estate,
Off Veera Desai Road,
Andheri West, Bombay-58.
8. M/s. Bakubhi Ambalal Pvt. Ltd.,
Shanti Sadan,
Mirzapur Road, Ahmedabad-1.

10. Name and Addresses of Raw Materials Suppliers :

(a) *PVC Resin* :

1. Shriram Chem. Industries,
Shrirampura, Kota (Raj.).
2. National Organic Chemical Indl. Ltd.,
Sandox House, Dr. A. Besant Road, Worli,
Bombay-18.
3. Chemplast, Dhun Bldg.,
175/1, Mount Road, Madras-2.
4. Plastic Resin & Chemicals Ltd.,
Bharat Insurance Building, 15-A,
Hroniman Circle, Bombay-1.
5. Calico Chemicals & Plastic & Fibre Divn.,
Anik Chamber, Bombay-74.

(b) *Lubricants/processing aids, pigments and stabilizer* :

1. Sudershan Chemicals Inds. Ltd.,
162, Wellesely Road, Poona-1.
2. Colours Chemicals Ltd.,
Ravinder Annexe, 194, Churchgate,
Redamation, Dinshaw Vacha Road,
Bombay-2.
3. Chikka Ltd.,
Mehta Chambers, 13 Methew Road,
Bombay-4.

4. Dura Chemical Corp. Pvt. Ltd.,
11-Sprott Road,
Ballard Estate, Bombay-1.

5. Waldies Ltd.,
A-1, Gillander House,
Netaji Subhash Road,
Calcutta-1.

6. A.L.A. Chemical Pvt. Ltd.,
Mahalaxmi Chambers,
Bhulabhai Desai Road,
Bombay-20.

7. Indian Vegetable Products,
Forbes Building,
Home Street, Bombay-1.

8. Indokem Pvt. Ltd.,
Fort House, 221 D.N. Road,
Bombay-1.

9. Hico Products Pvt. Ltd.,
Mogal Lane, Mahim,
Bombay-16.

(c) *Plasticizers* :

1. Indo Nippon Chemical Co. Ltd.,
Alice Building, 339, D. N. Road,
Bombay-1.

2. Indian Organic Chemicals Ltd.,
28, Apollo Street,
Bombay-1.

3. East Anglia Plastics India (Ltd.),
East Anglia House 3,
Camac Street,
Calcutta-16.

4. Herdillia Chemicals Ltd.,
Air India Building, Narimanpoint,
Bombay-1.

5. Union Carbide India Ltd.,
Kasturi Building, Jamshedji Tata Road,
Bombay.

6. Jay Chemicals,
'MULRATNA', 334, Narsinatha Street,
Bombay-9.

(Reserved item Sl. No. 147).

I. Introduction

The manufacture of rubber eraser has good potential for development in small scale sector. These are required in large number by school and college students. In addition to common type pencil eraser, there exists a good market demand for special types of erasers viz. typewriter eraser, ink eraser etc. The demand for items like eraser is closely linked with the growth of education and industrial development. With the increasing number of schools, colleges, technological institutions, offices and other establishments the market requirement of eraser is expected to increase manifold.

Natural rubber is the most commonly used raw material for the manufacture of erasers. However, for special application, synthetic rubber and other thermoplastics may be used. Present scheme envisages for manufacture of common type pencil erasers and typewriter eraser.

II. Technical Aspects

(a) Process outline :

The process of manufacture essentially consists of firstly mixing the various ingredients of the rubber compound and then moulding the same in the form of desired size of bars. Commonly used recipe giving details of the various materials is as given below :

(i) Palecrepe	450	kg.
(ii) Sulphur	27	kg.
(iii) Accelerators	18	kg.
(iv) Zinc oxide	36	„
(v) Stearic acid	4.5	„
(vi) Light calcined Mgo	160	„
(vii) Ammonium oleate	75	„
(viii) Eraser crumbs	560	„
(ix) White factice	1300	„
(x) Whiting	1100	„
(xi) Anti-oxidant	6.75	„
(xii) Titanium dioxide	25	„
(xiii) Fast colour	18	„

N.B. In case of ink erasers, glass powder and pumice powder of suitable quantity would be required.

Palecrepe is first masticated in a mixing mill and then the remaining ingredients are added gradually excepting sulphur. When the mixing is complete, sulphur is added and the rubber compound is drawn in the form of a sheet of desired thickness. The sheet is then pressed in the mould in the hydraulic press. The moulded sheet is cut into the pieces of desired shape and size. Individual pieces are then stamped to have the brand name and then these are packed for marketing.

(b) Quality Specifications :

The erasers are to be manufactured as per market requirements.

(c) Production Capacity (per annum)

(i) Quantity	60,000 Nos. Gross.
(ii) Value	Rs. 5,10,000.00

III. Financial Aspects

1. Fixed Capital :

(i) Land and Building	Rented
Plot Area	300 sq. meters
Covered area	200 sq. meters

(ii) Machinery and Equipment :

Production unit

Mixing Mill—with chilled rolls size 12" × 30" attached with motor of 25 H.P. and reduction gear, batch capacity 12 kg. corresponding to 30 minutes cycle.	1 No.	65,000.00
Hydraulic Press—50 tonnes capacity size 18"×18", 4 daylight, complete with hydraulic pump	2 Nos.	50,000.00
Cutter power operated	2 Nos.	6,000.00
Grinder—bowl type motorised lined with grinding media	2 Nos.	10,000.00
Hand operated press for marking	1 No.	2,000.00
Baby boiler, cross tube, coal fired vertical, capacity 300 lb./hour, working steam pressure 100 psi, with 3 H.P. motor complete with other accessories	1 No.	10,000.00

Maintenance Unit

Miscellaneous tools of value	2,000.00
Testing equipment such as hardness tester, ageing oven, thickness gauge physical balance, etc.	5,000.00

Total (Machinery & Equipment)	1,50,000.00
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B. F.	1,50,000
Electrification and Installation Charges @ 10% of cost	15,000.00
Cost of moulds	3,000.00
Cost of office equipment	2,000.00
Total Fixed Capital	1,70,000.00

2. Working Capital

(i) Personnel

(a) Administrative & Supervisory—		
Chemist	1	1,000.00
Accountant	1	500.00
Salesman	2	800.00
Clerk/Steno	1	300.00
Peon/Chowkidar	1	200.00
(b) Technical—		
Skilled worker	4	1,400.00
Semi-skilled worker	6	1,500.00
Perquisites @ 15% of salaries		850.00
Total (Personnel)		6,550.00

(ii) Raw materials etc.

1. Palecrape	450 kg. @ Rs. 12 per kg.	5,400.00
2. Sulphur	27 kg. @ Rs. 2 per kg.	54.00
3. Accelerators	18 kg. @ Rs. 50 per kg.	900.00
4. Zinc oxide	40 kg. @ Rs. 13 per kg.	520.00
5. Stearic Acid	5 kg. @ Rs. 11 per kg.	55.00
6. Calcined MgO	160 kg. @ Rs. 1 per kg.	160.00
7. Ammonium Oleate	75 kg. @ Rs. 15 per kg.	1,125.00
8. Eraser Crumbs	560 kg. @ Rs. 0.50 per kg.	280.00
9. White factice	1300 kg. @ Rs. 5 per kg.	6,500.00
10. Whiting	1100 kg. @ Rs. 0.40 per kg.	440.00
11. Antioxidants	6.75 kg. @ Rs. 20 per kg.	135.00
12. Titaniumdioxide	25 kg. @ Rs. 20 per kg.	500.00
13. Fast Colour	18 kg. @ Rs. 50 per kg.	900.00
		16,960.00

(iii) Utilities :

1. Power	3000 KWH @ Rs. 0.30 per unit	900.00
2. Water	100 KL @ Rs. 0.70 per KL	70.00
3. Coal	5 tonnes @ Rs. 240 per ton	1,200.00
Total (Utilities)		2,170.00

(iv) Other Contingent Expenses :

1. Rent	2,000.00
2. Postage & Stationery	100.00
3. Telephone	100.00
4. Consumable stores	100.00
5. Repair & maintenance	200.00
6. Transport charges	250.00
7. Advertisement & Publicity	250.00
8. Taxes	100.00
Total (Contingent expenses)	3,100.00

(v) Total Recurring Expenses (Per month)	29,000.00
(vi) Working Capital (for 3 months)	87,000.00

3. Total Capital Investment :

Fixed Capital	1,70,000.00
Working Capital	87,000.00
	2,57,000.00

4. Cost of Production (per year) :

Total recurring cost per year	3,48,000.00
Depreciation on machinery & equipment @ 10%	16,500.00
Depreciation on moulds @ 25%	750.00
Depreciation on office equipment @ 20%	400.00
Interest on Total Investment @ 15%	38,550.00
	4,04,200.00

5. Turn-over per year :

Rubber Erasers	60000 Nos. @ 8.50 of gross	5,10,000.00 per gross
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6. Net profit per year (5—4)

= Rs. 5,10,000.00—4,04,200.00
= Rs. 1,05,800.00

7. Rate of Return

8. Break-even Point

Addresses of Rubber Machinery Suppliers :

1. M/s. Sohal Engg. Co.,
L. B. Shastri Bhandup,
Bombay-78.
2. M/s. National Engg. & Machine Mfg. Co.,
34, Sastitla Road,
Calcutta-11.
3. M/s. Anant Engg. Works,
Sirhind, N. Rly., Punjab.
4. M/s. Gansons Pvt. Ltd.,
6, West View, Dadar, Bombay.
5. M/s. Slach Engg. Works,
15 Najafgarh Road,
New Delhi-15.
6. M/s. Modern Metal Works,
Opp. Paharganj, Police Station,
Delhi.

Addresses of Rubber Raw Materials Suppliers :

1. M/s. Plantation Corpn. of Kerala Ltd.,
Chempara Thimoottila, Nagapadam, Kottayam-6.
2. M/s. Pandinjarekkara Rubber Industries,
P. B. No. 22, Kottayam.
3. M/s. Imperial Chemical Inds. (I) Pvt. Ltd.,
P.B. No. 810, Crescent House, Ballard Estate,
Bombay-1.
4. M/s. Bayer (India) Ltd.,
Nagin Mahal, Virnarman Road, Bombay.
5. M/s. Monsanto Chemicals (I) Pvt. Ltd.,
Weikfield House, Sprott Road,
Bombay.

(Reserved item Sl. No. 118)

I. Introduction :

Dipped goods from Rubber latex, specially surgical gloves, industrial gloves, finger stalls, catheter, surgical and veterinary appliances are increasing demand. Dipped rubber goods are especially amenable to manufacture in the small scale sector.

II. Technical Aspects :

(a) Process Outline :

Rubber chemicals like Zinc oxides, Sulphur, Accelerators, Antioxidents etc. are dispersed with Dispersal L.N. in pot mill. In a hobart mixer centrifuged latex and measured quantities of chemical dispersion are mixed. Moulds made of porcelain & wood are then dipped and coagulated to give the desired thickness. The products are vulcanised in hot air oven.

(b) Quality Specifications : As per relevant IS specifications or customers, requirements.

(c) Production Capacity (per annum/single shift working)

(i) Quantity—

1. Industrial Gloves	26,400 Nos.
2. Surgical Gloves	7,200 Nos.
3. Finger stalls	96,000 Nos.
4. Transfusion tubes	72,000 Nos.

(ii) Value Rs. 2,71,200/-

III. Financial Aspects

Fixed Capital

(i) Land and Building

Land	500 sq. metres	Rented.
Built area	200 sq. m.	
Office, Stores etc.	20 sq. metres.	Rs.
Working Shed	180 sq. metres	900.00
		900.00

(ii) Machinery and Equipment

1. Hobart type mixer—3 speed 25 Lit/cap. 2 HP Motor	1 No	15,000.00
2. Pot Mill—6 pots with 3 HP Motor	1 No.	5,000.00
3. Thermostatically controller air oven 3'× 3'× 2' (2 KW)	1 No.	9,000.00

4. Coagulation tanks—Plastic 25 litres. cap.	5 Nos.	1,000.00
(iii) Testing Equipments		10,000.00
(iv) Electrification & Installation charges @ 10% of cost of machine & equipment		4,000.00
(v) Cost of Moulds/other fixtures		3,000.00
(vi) Cost of office Equipment/Working table etc.		3,000.00
Total (Machinery & Equipments)		50,000.00

2. Working Capital (per month)

(i) Personnel

	No.	Salary Rs.	Total Rs.
Chemist/Manager	1	900.00	900.00
Clerk/Typist	1	300.00	300.00
Storekeeper/Accountant	1	400.00	400.00
Watchman	1	150.00	150.00
Skilled Workers	8	250.00	2,000.00
Unskilled Workers	4	150.00	600.00
			4,350.00
Perquisite @ 15% of Salaries			650.00
Total			5,000.00

(ii) Raw Materials :

(a) Latex 60% DRC	410 kg. @ Rs. 12/-	4,920.00
(b) Vulcastab L.S. 20%	5 kg. @ Rs. 40/-	200.00
(c) Zinc Oxide	40 kg. @ Rs. 13/-	520.00
(d) Sulphur	40 kg. @ Rs. 20/-	120.00
(e) Accelerator	20 kg. @ Rs. 40/-	800.00
(f) Antioxidant (Monox)	10 kg. @ Rs. 28/-	280.00
(g) Dispersal L.M.	2 kg. @ Rs. 10/-	20.00
(h) Cassien	3 kg. @ Rs. 30/-	90.00
(i) Caustic Soda	1 kg. @ Rs. 4/-	4.00
(j) Distilled Water	100 lit @ Rs. 0.75/-	75.00
(k) Calcium Nitrate	80 kg. @ Rs. 15/-	1,200.00
(l) Packing materials L.S.		1,700.00
		9,929.00
	Say	10,000.00

(iii) Utilities :

Power	2000 KWH	500·00
Water	100 Lit.	100·00
Total (Utilities)		600·00

(iv) Contingent Expenses :

Rent	Rs.
Postage & Stationery	900·00
Repair & Maintenance	400·00
Consumable stores and transport charges	400·00
Advertisement & Publicity	300·00
Insurance Taxes	200·00
Total (Contingent expenses)	2,400·00

(v) Total Recurring Expenses (per month) :

Personnel	5,000·00
Raw Material	10,000·00
Utilities	600·00
Contingent Expenses	2,400·00
Total	18,000·00

(vi) Working Capital for 3 months 54,000·00

3. Total Capital Investment :

(i) Fixed Capital	50,000·00
(ii) Working Capital for 3 months	54,000·00
	1,04,000·00

4. Cost of Production :

Total recurring Cost per year	2,16,000·00
Depreciation on machinery @ 10%	4,000·00
Depreciation on Moulds @ 25%	750·00
Depreciation on Office equipment @ 20%	600·00
Interest on total investment @ 15%	15,600·00
	2,36,950·00

5. Turn-over per year :

1. Industrial Gloves	26,400 Nos. @ Rs. 4/-	10,560·00
2. Surgical Gloves	7,200 Nos.s @ Rs. 3/-	21,600·00
3. Finger Stalls	96,000 Nos.s @ Rs. 0·75/-	72,000·00
4. Transfusion Tubes	72,000 Nos. @ Re. 1/-	72,000·00
Total		2,71,200·00

6. Profit per year (5—4) = 34,250

7. Rate of Return : 33%

8. Break-even Points : 65%

Supplier of machinery and Chemicals :

1. Kilburn & Co.,
2 Fairlie Place, Calcutta-1.
2. Andhra Scientific Corporation,
Mount Road, Madras.
3. C. A. Williners & Co.,
Bangalore.
4. I. C. I. (I) Ltd.,
34, Chowringhee, Calcutta-1.
5. Bayer (I) Ltd.
Thana, Maharashtra.
6. Mindia Chemical Ltd.
3/8 Asaf Ali Road,
New Delhi.

(Reserved item Sl. No. 124)

I. Introduction

This scheme envisages the manufacture of rubber mattresses for automobiles, 'O' rings, bushes and playballs.

Moulded rubber goods find extensive use in railways, automobiles, bicycles and also in many industrial and domestic appliances. The products range from play balls, bushes, oil Seals, 'O' rings, channels etc. to highly sophisticated items like rubberised shock absorbers, rubber rollers for printing etc. Because of its manifold use especially for industrial items, this manufacturing activity, may well be set up as ancillary to large scale units. In fact M/s. Tatas, Telco, Hindustan, Motors, Premier Automobiles, Ashok Leyland, Standard Motors etc. depend largely on small scale units for their entire range of rubber parts. D.G.S.&D. also purchases substantial quantities of rubber moulded goods every year from small scale units.

The demand for different types of moulded rubber goods has been steadily increasing and some of the units producing moulded rubber goods are working additional shifts to meet the demand. Though specific information on the capacity, production and demand of this item are not available, it appears there is a good scope for the further development. Rubber moulded goods also offer export possibilities and a good number of small scale units are exporting these items to several countries.

II. Technical Aspects :

(a) Process Outlines :

All the rubber chemicals are mixed with rubber (both synthetic and natural) after proper mastication in a Rubber Mixing Mill, depending upon the nature of rubber used, it might be necessary some times to pass steam through the roller. After the compounding is over, it is usual practice to extrude the same to form slabs and cut pieces, after weighing they are fed into moulds and cured either with steam or electricity in presses (hand operated, hydraulic/automatic/semi-automatic). In some cases where metallic inserts are required (like oilseals), metallic inserts are first kept in the

mould and covered with rubber compound of definite weight and cured in presses. It is usual practice to use a bonding agent over the metal and the moulds are lubricated either with soap solution or aerosols of silicones.

(b) Quality Specifications : As per customers specifications or relevant IS Standards.

(c) Production Capacity (Per annum/shift)

- (i) Quantity . 120 M.T. of assorted products.
(ii) Value . Rs. 15,60,000-00

III. Financial Aspects :

I. Fixed Capital :

(i) Land and buildings :		Rented
Land	800 sq. metres	
Built areas	500 sq. metres	Rs. 2,250-00
Office	150 sq. metres	P.M.
Working Shed	350 sq. metres	

(ii) Machinery and Equipment :

(a) Rubber Mixing Mill—12" × 30" with chilled cast Rolls, 30 HP motor, reduction gear and other accessories	1	75,000-00
(b) Rubber mixing mill—12" × 30" with cast iron rolls, 30 HP motor, reduction gear and other accessories	1	30,000-00
(c) One Extruder 2-1/2"—10 HP motor with accessories	1	15,500-00
(d) Hydraulic Press—4 day light with pump, platen size 0-75 sq. m.	1	30,000-00
(e) Steam heated presses hand operated 16" × 16"	2	7,000-00
(f) Steam heated presses, hand operated 14" × 14"	2	6,000-00
(g) Steam heated presses hand operated 24" × 24"	2	13,000-00
(h) Vulcaniser 4' × 6' with trolley arrangements	1	10,000-00
(i) Boiler—10 NHP Rating 77	1	20,000-00
(j) Moulds—Assorted—L.S.		16,000-00
(k) Weighing machine—Platform	1	3,000-00
(l) Weighing machine—Branager type	1	500-00
(m) Miscellaneous tools	L.S.	2,000-00

ing Equipment :

	Rs.
(a) Thickness gauge	700.00
(b) Hardness Tester	800.00
(c) Tensile Testing Machine	18,000.00
(d) Compression Testing apparatus	2,500.00
(e) Impact Tester	4,000.00
(f) Abrador	3,000.00
(g) Ross Flex Machine	7,000.00
(h) Ageing Block	7,000.00
(i) Transformer—200 KVA	20,000.00
Electrification & Installation charges @ 10% of cost of machines	
equipment	29,000.00
Cost of office equipment/working tables etc.	5,000.00
Total (Machinery & equipment)	3,25,000.00

Working Capital (per month) :

(i) Personnel :

Administrative and Supervisory

	No.	Salary Rs.	Total Rs.
(a) Foreman/Supervisor	2	500.00	1,000.00
(b) Accountant cum-Store-keeper	1	500.00	500.00
(c) Clerk/Typist	2	350.00	700.00
(d) Peon/Watchman	4	150.00	600.00
Technical Staff			
(e) Chemist/Manager	1	1000.00	1,000.00
(f) Asstt. Chemist	1	450.00	450.00
(g) Skilled Workers	12 @ 15 per day		4,500.00
(h) Semi-Skilled	6 @ 10.00 per day		1,500.00
(i) Unskilled	10 @ 5.00 per day		1,250.00
Perquisites 15% of salaries			1,610.00
Total (Personnel) (Say)		Rs.	13,110.00
			13,745.00

Raw Materials

Natural Rubber	2250 Kg. @ 10/Kg.	22,500.00
Synthetic Rubber SBR	2250 Kg. @ 8/Kg.	18,000.00
Synthetic Rubber nitrile & Neoprene (Imported)	500 Kg. @ 25/-Kg.	12,500.00
China Clay	3000 Kg. @ 0/50 Kg.	1,500.00
Whiting	3000 Kg. @ 0/50 Kg.	1,500.00
Zinc Oxide	200 Kg. @ 14/Kg.	2,800.00
Stearic Acid	100 Kg. @ 12/Kg.	1,200.00
Carbon black	100 Kg. @ 8/Kg.	800.00
Accelerators	75 Kg. @ 40/Kg.	3,000.00
Antioxidants	75 Kg. @ 45/Kg.	3,375.00
Antiozonents	25 Kg. @ 50/Kg.	1,250.00
Paraffin Wax.	50 Kg. @ 3/Kg.	150.00

Wood Rosin	50 Kg. @ 3/Kg.	150.00
Spindle Oil	100 lit. @ 3/kg. it.	300.00
Sulphur	100 Kg. @ 3/Kg.	300.00
Plasticizers DBP	250 Kg. @ 15/Kg.	3,750.00
Aluminium		300.00
Calcium Silicate	1000 Kg. @ 3/Kg.	300.00
Sodium Nitrite	50 Kg. @ 5/Kg.	250.00
Silicones	L.S.	200.00
Packing materials	L.S.	1,000.00
Colours	L.S.	400.00
Ammonium Chloride	50 Kg. @ 3/Kg.	150.00

Total (Raw Materials) **75,475.00**

(iii) Utilities (Per month) :

Power 15000 KWH Units	3,000.00
Fuel (steam/Furnace oil) 25 tons	2,500.00
Water 100 KL	100.00
Total (Utilities)	5,600.00

(iv) Contingent Expenses :

Rent	2,250.00
Postage & Stationery	500.00
Repairs & Maintenance	1,350.00
Advertisement Publicity at 1% of total sale	1,200.00
Minor Taxes & Insurance etc. 1½	1,800.00
Total (Contingent Expenses)	7,100.00

(v) Total Recurring Expenditure :

Staff and labour	13,145.00
Raw Material	75,475.00
Utilities	5,600.00
Other Contingent expenses	7,100.00
Rs.	1,01,320.00

(vi) Total Working Capital for 3 months **3,03,960.00**

3. Total Capital Investment

(i) Fixed Capital	3,25,000.00
(ii) Working Capital for 3 months	3,03,960.00
	6,28,960.00

Total (Capital Investment) (Say) Rs. 6,29,000.00

4. Cost of Production (per year)

Total recurring costs per year	12,15,840.00
Depreciation on machinery & Equipment @ 10%	32,000.00
Depreciation on office equipment @ 20%	1,000.00
Interest on total Investment @ 15%	94,350.00
Total (Cost Production)	13,43,190.00

5. Turn-over (per year)
 Rubber Goods (Moulded) —120 M.T.

Rs.
 15,60,000.00
 15,60,000.00
 2,16,810.00

6. Profit per year (5—4)
 7. Rate of Return 34%
 8. Break even Point 52%

Machine Suppliers

1. M/s. Indian Expeller Works,
A, Naroda Industrial Estate,
Naroda, Ahmedabad.
2. M/s. Sohal Engineering Works,
Off. Hamer Road,
Bombay.
3. M/s. Richardson and Cruddas Ltd.,
Byculla,
Bombay-8.
4. M/s. Bravo & Co.,
108, Patvarbagan Lane,
Calcutta-19.

Rubber Chemicals

1. M/s. I.C.I. India Pvt. Ltd.,
P. O. Box No. 310,
Crescent House, Ballard Estate,
Bombay-1.
2. M/s. Bear India Ltd.,
Nagin Mahal,
Vir Nariman Road,
Bombay-1.
3. M/s. Monsanto Chemicals (India) Ltd.,
Wekefield House,
Sprott Road,
Bombay.

Laimed Rubber

M/s. Indian Rubber Regenerating Co.,
 32, Nicolols Road,
 Bombay-1.

Carbon Black

1. M/s. United Carbon (India) Ltd.,
135, Mahatma Gandhi Road,
Bombay-1.
2. M/s. Phillips Carbon Black, Ltd.,
Udyog Bhavan, Ballard Estate,
Bombay-1.

Process Oils & Solvents

M/s. Esso Standard Inc.,
 P. O. 181,
 Bombay-20.

Zinc Oxide

M/s. Kamani Metallic Oxides Pvt. Ltd.,
 Nicols Road, Kamani Chambers,
 Bombay-1.

Mineral Eillers

M/s. Kilachand Devachand Co. (P) Ltd.,
 Rubber Division,
 7, Jamshedji Tata Road,
 Bombay-20.

Synthetic Rubber

M/s. Kilachand Devachand Co. (P) Ltd.,
 Rubber Division,
 7, Jamshedji Tata Road,
 Bombay-20.

Stearic Acid

M/s. Godrej Soap Pvt. Ltd.,
 3/6, Delisle Road,
 Bombay-11.

Testing Equipment

- (a) M/s. India Engineering Co.,
Worli Naka, P. B. No. 16551,
Bombay-18.
- (b) M/s. Kamal Metal Industries,
Arun Park,
Bhaipura, Khokra Mohemdabad,
Ahmedabad-8.

(Reserved item Sl. No. 115)

RUBBER TO METAL BONDED PARTS
(ENGINE MOULDINGS)

I. Introduction

The demand of rubber moulded goods particularly automobiles ancillaries has been increasing regularly because of their use in machinery and engines etc. with the rise of population of vehicles and the expansion of transport industry. These goods being one of the important equipment are the easily saleable items. Moreover good quality products have a good scope in the export market also.

Engine mountings constitute the very critical part of machine/ automobile. The efficiency/quality of any hydraulic system used either in a equipment or in automobile engine is determined by the quality of engine mounting. The demand of the same has been increasing rapidly because of their usage in automobile/ engines. With the development of transport industry and industrial development in the country the demand of oil seal has become many fold. If the good quality could be ensured the engine mountings have tremendous scope from the marketing consideration.

As general market practice either engine mounting can be sold as original equipment directly to automobile/machine manufacturer or could be sold through distributors for replacement purposes. The technology machine as well as the raw materials for the manufacture of these seals are indigenously available.

II. TECHNICAL ASPECTS

(a) Process outline :

All the rubber chemicals are mixed with rubber (both synthetic and natural) in a rubber mixing mill. Depending upon the nature of rubber used, it might be necessary sometimes to pass steam through the rollers. After the compounding is over, compound fed into moulds and cured either with steam or electricity in presses (either hand operated or automatic/semi-automatic etc.). In the case of engine mounting metallic inserts are first kept in the mould and covered with rubber compound of definite weight and cured in presses. It is usual practice to use a bonding agent over the metal and the moulds are lubricated either with soap solution or aerosols of silicon.

Rubber composition for engine mounting

Smoked sheet	100 parts by wt.
Zinc oxide	7.5 " " "
Stearic acid	2.0 " " "
GPF black	2.0 " " "
Sulphur	2.5 " " "
Accicure HBS	0.7 " " "
Accilard A	0.5 " " "
Accinox B	2.0 " " "

(b) Quality Specifications

Most of the units manufacturing these items function as ancillary unit to large scale industries. The products are manufactured strictly to the standards and specifications required by the purchasing units.

(c) Production Capacity (per annum)

- (i) Quantity — 30,600 Nos.
(ii) Value — Rs. 9,79,200

III. Financial Aspects

1. Fixed Capital

- (i) Land & Building : Rented
Plot Area — 250 sq. meters
Covered Area — 200 sq. meters

(ii) Machinery & Equipment :

Production Unit

Rubber mixing mill—12" x 36" with chilled cast iron rolls. 30H.P. motor with reduction gear and other accessories 1 40,000.00

Hydraulic press—Single day-light with pump platen size 0.75 sq. m. hydraulic arrangement operated with 1 H.P. motor 4 50,000.00

Boiler—baby, cross tube, vertical, cap 300 lb/hour weight 8', 4 cross tube of 3-1/4 size each working pressure 100 psi with 3 H.P. motor, and complete with accessories 1 10,000.00

Maintenance unit :

Miscellaneous tools of value 3,000.00

Testing equipment, viz. hardness tester, thickness gauge, ageing oven, oil resistant testing assembly, weighing balance, glasswares for chemical laboratory etc. 7,000.00

Electrification & installation charges @ 10% of cost of machine & equipment 10,000.00

Cost of moulds 10,000.00

Cost of office equipment/working tables etc. 5,000.00

Total Fixed Capital 1,25,000.00

2. Working Capital

(i) Personnel

(a) Administrative & Supervisory

		Rs.
Salesman	1	400.00
Storekeeper	1	300.00
Peon/Chowkidar	1	200.00

(d) Technical

Production Supervisor	1	900.00
Skilled Worker	4	1,400.00
Semi-skilled worker	4	1,000.00
Unskilled worker	4	800.00

5,000
Add perquisites @ 15% of Salaries 750

Total (Personnel) 5,750.00

(ii) Raw Materials

		Rs. per kg.	Rs.
P.C.R.C. Sheets	3250 Kgs	4.50	14,625.00
Smoked sheet	2500 "	11.00	27,500.00
Zinc oxide	180 "	13.00	2,340.00
Stearic Acid	50 "	13.00	650.00
G.P.F. Black	500 "	5.00	2,500.00
Sulphur	60 "	2.00	120.00
Accicure H.B.S.	15 "	50.00	750.00
Accitard A	12 "	40.00	480.00
Accinox B	40 "	40.00	1,600.00
Packing expenses			435.00
Total			51,000.00

(iii) Utilities

Power 3000 KWH @ Rs. 0.30 per KWH	900.00
Fuel 5 MT @ Rs. 240/- M.T.	1,200.00
Water 100 KL @ Rs. 0.70/ KL	70.00
Total (Utilities)	2,170.00

(iv) Other Contingent expenses

	Rs.
1. Postage & Stationery	2,000.00
2. Consumable stores	180.00
3. Maintenance & Repair	250.00
4. Transport & Travelling	200.00
5. Advertisement	200.00
6. Taxes	100.00
Total (Contingent expenses)	3,080.00

(v) Total Recurring Expenses (per month) 62,000.00

(vi) Working Capital (for 3 months) 1,86,000.00

3. Total Capital Investment

Fixed Capital 1,35,000.00
Working Capital 1,86,000.00

4. Cost of Production (per year)

Total recurring expenditure per year 7,44,000.00
Depreciation on machinery & equipment @ 10% 12,000.00
Depreciation on moulds @ 25% 2,500.00
Depreciation on office equipment @ 20% 1,000.00
Interest on Capital Investment @ 15% 48,150.00

8,17,650.00

5. Turn-over per year

By sale of 30600 Nos.
of Engine mounting
@ 32 per piece 9,79,200.00

6. Net Profit per year (5—4)

Rs. 9,79,200 — 8,17,650.00
= Rs. 1,61,550.00

7. Rate of Return — 50%

8. Break-even point — 44%

Addresses of Rubber Machinery Suppliers :

1. M/s. Sohal Engineering Co.,
L. B. Shastri Bhandup,
Bombay.
2. M/s. National Engineering & Mechine Mfg. Co.,
34, Sastitala Road.
Calcutta-11.
3. M/s. Anant Engineering Works,
Sirhind, R. Railway (Punjab)
4. M/s. Gansons Pvt. Ltd.,
6, West View,
Dadar, Bombay.
5. M/s. Slach Engg. Works,
15, Najafgarh Road,
New Delhi-15.
6. M/s. Modern Metal works,
Opp. P. haraganj, Police Station,
Delhi.

Addresses of Rubber Raw Materials Suppliers :

1. M/s. Plantation Corporation of Kerala Ltd.,
Chempara Thimoottila Nagapadam,
Kottayam-6.
2. M/s. Padinjarekkara Rubber Industries,
P. B. No.
Kottayam.
3. M/s. Imperial Chemical Industries (I) Pvt. Ltd.,
P. B. No. 810,
Crescent House, Ballard Estate,
Bombay.
4. M/s. Bayer (India) Ltd.,
Nagin Mahal,
Virnariman Road, Bombay.
5. M/s. Monsante Chemicals (I) Pvt. Ltd.,
Weikfield House, Sprott Road,
Bombay.

(Reserved item Sl. No. 120)

I. Introduction

Safety matches can be manufactured in the small and cottage scale. It is a consumable item required by every household and no marketing problems are envisaged. Further this industry is reserved for the small scale and cottage sector. At present about 50% of the country's requirements are being met by the small scale sector of the match industry.

For starting a match factory an application for registration has to be made to the Superintendent of the Central Excise of the district or the Assistant Collector of Central Excise of the region, where the factory is proposed to be located. The application may be made in the prescribed form together with the sketch of the factory.

A licence from the Municipal Corporation will have to be obtained after payment of the prescribed fees. Licenses are also compulsory under the Arms Act for the storage and use of Potassium Chlorate and Sulphur. This licence may be obtained from the local District Magistrate. Licence under factories Act, if applicable, will also have to be obtained from the Inspector of Factories.

II. Technical Aspects

(a) Process Outline :

Small Scale and cottage units obtain box veneers and splints from factories. For making inner and outer boxes the veneers are folded to the shapes of boxes and blue match paper is pasted on it with tapioca flour paste. The splints are filled into frames for dipping, each frame consisting of 60 laths and each lath having 50 grooves running across its width. Splints protruding from the frame are dipped in molten paraffin wax and then placed tip side up on a flat hot iron plate. Excess of paraffin waxes seeps down and is uniformly distributed on the splints.

The splints in the frame are then dipped in the head composition mixture on the dipping table, to a depth of 2 to 3 mm. The frames containing the dipped splints are placed in racks with heads down for drying. For drying, the frames can be kept outside for the sun drying, and during,

the rainy season the drying can be effected by storing the racks in a room and keeping over night. The dried sticks are then filled in boxes, 50 numbers each and the boxes are arranged in a frame and the two edges are painted with a solution of the friction composition. Dried boxes are labelled, sealed with excise banderols and packed in dozens in blue paper and again 5 dozens are made into a bundle using water proof kraft paper with label attached.

The scheme envisages that blue match paper cut to the required size and printed labels, are obtained from outside. Also, frame-filling, making of inner and outer boxes and box filling shall be carried out by piece-rate workers in their residences.

Process of mixing

Head composition

The required quantity of glue is soaked in water and kept for 12 hours. Then it is heated in a water bath to attempt of 60-80°C for 15 to 30 minutes with stirring. Formaldehyde solution of 2% strength may also be added about 20% of the total weight of the mixture) during rainy seasons which will act as a preservative. To the mixture prepared above potassium dichromate is added in a finely powdered form. The requisite quantity of potassium chlorate is added to the above solution with stirring. Sulphur, Manganese dioxide, ferric oxide, glass powder and rosin are powdered, well sieved through a 300 mesh sieve and added to the above mixture and stirred well with a little quantity of warm water. Then it is ground in the hand grinding machine. After grinding it is stirred well by wooden stirrers and warmed before taking to the dipping plates.

Side composition

The glue solution is made as in the above case. A mixture of antimony sulphide and glass powder well sieved through 300 mesh sieve is added to it. After grinding, a solution of dichromate of desired quantity is added and stirred and finally red phosphorous is added to the above mixture and warmed. The mixture is ready for painting, while painting or brushing it should be seen that the mixture is warm.

A typical formulation for the head composition of match sticks and side composition of boxes are given below :—

Side composition Head composition
(for 25 gross) (for 25 gross)

Chemical	Wt. in Kg.
Red phosphorous	0.180
Antimony sulphide	0.040
Glass powder	0.050
Glue	0.050
Potassium dichromate	0.005
Water	0.5 litre

Chemical	Wt. in Kg.
Potassium chlorate	1.600
Glue	0.320
Glass powder	0.375
Potassium dichromate	0.030
Rosin	0.030
Manganese dioxide	0.340
Ferric oxide	0.680
Water	1.2 litres

(b) Quality Specifications : IS : 2653—1964

(c) Production capacity (Annual/Shift)

(i) Quantity — 30,000 gross match boxes

(ii) Value — Rs. 3,60,000.00

III. Financial Aspects

1. Fixed Capital

(i) Land and Building (Rented)
Office, stores rooms 75 sq. metre.
Working shed consisting of 75 sp. metre.
paraffin and dipping room,
grinding room brushining room,
labelling and racking room. —150 sq. metre.
Rented at Rs. 400/-
per month

(ii) Machinery and Equipment

	Nos.	Rs.
1. Wooden frames for filling splints containing 60 lakhs and each lath having 50 grooves	300	12,000.00
2. Cast iron levelling table 2½' x 3'	1	300.00
3. Paraffining table with tray and hot plate	1	400.00
4. Dipping table for dipping of sticks with leveller	1	500.00
5. Wooden racks to held 30 frames	10	2,000.00
6. Side painting frame	20	300.00
7. Hand operated paper cutting machine 16"	1	3,000.00
8. Weighing scale, ordinary to weigh upto 5 kgs. capacity	1	250.00
9. Iron pan for water bath	2	50.00
10. Galvanised iron brackets	4	100.00
11. Hand operated Chemical grinder	1	250.00
12. Kerosine stove	2	50.00
13. Miscellaneous items such as brushes, wooden hammer, utensils, baskets etc.		500.00
14. Office equipments and furniture		2,500.00
Total (Machinery & Equipment)		22,450.00
Total Fixed Capital	Say,	23,000.00

2. Working Capital (per month)

(i) Personnel

		Rs.
1. Supervisor	1 No. 400/-	400.00
2. Clerk	1 No. 300/-	300.00
3. Skilled workers	2 Nos. 250/-	500.00
4. Unskilled Workers	3 Nos. 200/-	600.00
5. Watchman	1 No. 150/-	150.00
Total Salary		1,950.00
Pre-requisites @ 15% of Salary		292.50
Total (Personnel)		2,242.50

Frame filling, inner and outer box making and box filling to be carried at the residences of the workers on a piece rate system.

	Rs.
(1) Frame filling Rs. 0.08 per frame	600.00
(2) Box filling Rs. 0.20 per gross	500.00
(3) Outer box Rs. 0.08 per gross	200.00
(4) Inner box Rs. 0.10 per gross	250.00
	1,550.00

Total (for wages) Rs. 3,792.50

(ii) Raw Material including packagings

	Qty.	Rate	Value
		Rs.	Rs.
Splints, 600 gms/gross, 60 kgs/day or 1500 kg/month	1500 kg.	2/- per kg.	3,000.00
Veneers 500 gms/gross 50 kgs/day	1250 kg.	1.50 per kg	1,875.00
Tapioca flour	100 kg.	2/- per kg.	200.00
Blue match Paper	32 ream	70/- per ream	2,240.00
Kraft paper	6 rolls	20/- per roll	120.00
Labels	2800 gross	0.50 per gross	1,400.00
			8,835.00

Chemicals :

For splings (tip composition)

	Rs.
1. Potassium chlorate 160 kg.	Rs. 7/- kg. 1,120.00
2. Glue 32 kg.	Rs. 5/- kg. 160.00
3. Sulphur (imported) 11.5 kg.	Rs. 2/- kg. 23.00
4. Glass Powder 37.5 kg.	Rs. 1 kg.. 37.00
5. Potassium dichromate 3 kg.	Rs. 16/- kg. 48.00
6. Rosin 3 kg.	Rs. 6/- kg. 18.00
7. Manganese dioxide 34 kg.	Rs. 1/- kg. 34.00
8. Ferric oxide 68 kg.	Rs. 1/- kg. 68.00
9. Paraffin wax 70 kg.	Rs. 4/- kg. 280.00
	1,788.00

For Side Composition :

			Rs.
1. Red phosphorous (imported)	18 kgs.	60/-	1,080.00
2. Antimony sulphide	4	30/-	120.00
3. Glass powder	5	1/-	5.00
4. Glue	5	5/-	25.00
5. Potassium dichromate	0.5	16/-	8.00
			1,238.00
Total (Raw Materials) etc.			11,861.00

(iii) *Utilities :*

Power and water	20.00
Fuel (Firewood and kerosene)	100.00
Total (Utilities)	120.00

(iv) *Contingent expenses :*

Rent	400.00
Postage and Stationery	100.00
Repairs and maintenance	50.00
Transport charges	200.00
Sales expenses	200.00
Consumable stores	100.00
Total (contingent expenses)	1,050.00

(v) Total recurring expenditure (i) to (iv)	16,824.00
(vi) Total working capital for 3 months	50,472.00

(3) *Total Capital Investment :*

(i) Fixed Capital	22,450.00
(ii) Working Capital for 3 months	50,472.00
	72,922.00

(4) *Cost of Production (per year)*

Total recurring cost per year	2,01,888.00
Depreciation on equipments @ 20%	4,490.00
Interest on investment 15%	10,938.00
Excise duty, Rs. 3.75 per gross for 30,000 gross boxes	1,12,500.00
	3,29,816.00

Turnover (per year)

Match boxes 30,000 gross Rs. 12/- per gross 3,60,000.00

(6) Profit (Rs. 3,60,000.00 — Rs. 3,29,816.00) = Rs. 30,184.00	
(7) Ratio of return	= 41%
(8) Breakeven point	= 58%

Addresses of machinery and equipment :

1. M/s. Kaka Iron Foundry, Thiruttangal, Sivakashi, Tamil Nadu.
2. M/s. E. P. Brothers, Ottappalam, Kerala.
3. M/s. John & Sons, Engineers & Founders, Valianur, Trichur, Kerala.
4. M/s. Shanmugam Engineering & Trading Co., Feroke, Calicut, Kerala State.
5. M/s. Southern Match Traders, 8/10, Abdul Rahim Road, Race Course, Coimbatore-641018.

Addresses of raw material suppliers :

1. *Splints and Veneers :*

1. M/s. Veneer Mills, Mahadevanur, Japuri Extension, Mysore.
2. Timbers and Matches Ltd., Dharmadam Post (Via) Tellicherry, Kerala.
3. St. Joseph Match Industries, Gandhinagar, Tiptur, Tumkur District, Karnataka State.

2. *Potassium chlorate :*

1. M/s. Wimco Ltd., Ambarnatha, Bombay.
2. M/s. Pandian Chemicals, Madurai, Tamil Nadu.
3. M/s. Travancore Chemicals & Mfg. Co. Ltd., Kundara, Quilon Distt., Kerala.

Match Chemicals :

1. Jaganath Trading Co., Match Chemical Dealers, Sivakasi, Tamil Nadu.
2. India Scientific Traders, Furrhong Mansion, 4600, Sardar Vallabhai Street, Bombay-4.
3. M/s. Prabnath General Agencies, 195, Kalbadevi Road, Bombay-1.
4. M/s. Dass And Co., (India) Ltd., 43, Dharmastala Street, Calcutta-1.
5. M/s. Ratna Chemical Industries, No. 22, Alandur Road, Sydapet, Madras-15.
6. M/s. Parry and Co., Post Box No. 12, Madras-1.
7. M/s. Lakshmi Starch Factory Ltd., Kundara, Kerala.

(Reserved item Sl. No. 313)

I. Introduction

Indians Sandal wood oil has name in the world and it has been reported that 90% of its total production is being exported to various countries. It is known as East Indian Sandal Wood oil which is steam distilled from the root and hard heart wood of *santalum Album*. This tree occurs in Coorg; Madras and Mysore. Mysore controls about 7/8th of the world's production of Sandal Wood oil. The trees are cut which are at least 30 years old and have a circumference of at least 15" which are auctioned almost every year regularly.

The oil is yellowish in colour, with a characteristic heavy sweet lasting odour. It contains at least 90% santalol. It is used in medicine and in perfumery. It has excellent fixative properties and almost all compositions contain sandal wood oil. About 90 percent oil is consumed in soap, perfumery and cosmetics.

In view of the heavy demand by the perfume manufacturers of the world due to its excellent quality as fixative the demand is gradually increasing (as its substitutes by synthetic means as not yet been developed). The foreign buyers are very much fancy for this oil. As such there appears to be enough potential for the oil to take care of entire sandal wood availability for this purpose.

II. Technical Aspects

(a) Process outline

The essential oil is located in the heart wood of the trunk and root. The sandal wood are cut into small pieces and these pieces are powdered in a disintegrator. The best method for the production of essential oil is steam distillation process.

(b) Quality Specification : IS: 320-1961

(c) Production Capacity

(per annum on single shift working) :

Quantity — 2880 kg. oil
Value — Rs. 23,04,000.00

III. Financial Aspects

1. Fixed Capital

(i) Land & Building :

	Rs.
Land — 2000 sq. meters	30,000.00
Built up area (office, stores etc.) 25 sq. mt.	80,000.00
Working shed 100 sq. metres	
Total	1,10,000.00

(ii) Machinery & Equipment :

Description	Indegenous/ Imported	Qty.	Price
			Rs.
1. Steam distillation still (4' dia Ind. × 6' height) with condensers and Oil separators etc.		2	2,50,000.00
2. Disintegrator (Hammer Type) „		1	25,000.00
3. Water cooling tower with tank cooling capacity 1000 gal/hour „		1	52,000.00
4. Centrifugal filtration unit „		1	8,000.00
5. Air conditioner for storage of oil 1.5 ton capacity with 4 KVA stabiliser „		1	13,500.00
6. Boiler vertical coal fired smoke tube 150 lbs/sq. in. h. workable pressure 100 lbs/ per sq. inch Rating 300-400 sq. ft. „		1	2,50,000.00
7. Laboratory Equipment (Testing) „			22,000.00
8. Miscellaneous Equipment „			10,000.00
9. Tubewell 4" boring 3" × 2" tubewell with overhead tank			15,000.00
10. Electrification and installation charges @ 10% cost of machine			64,550.00
11. Office equipment including typewriter.			15,000.00
Total cost of machinery and equipment			7,25,050.00
Total fixed Capital (i) + (ii) above			8,35,000.00

2. Working Capital (per month)

(i) Personnel

Designation	No.	Salary	Total
<i>Administrative & Supervisory</i>			Rs.
1. Production Manager	1	1500/-	1,500.00
2. Analytical Chemist	1	800/-	800.00
3. Accountant-cum-clerk	1	500/-	500.00
4. Store-keeper-cum-time keeper	1	350/-	350.00

1	2	3	4
			Rs.
<i>Technical :</i>			
1. Distiller	3	300/-	900.00
2. Semi-skilled workers	4	225/-	900.00
3. Unskilled workers	4	200/-	800.00
4. Boiler Attendant	3	225/-	675.00
5. Watchman	3	200/-	600.00
6. Sales Representative	2	700/-	1,400.00
Total			8,425.00
perquisites @ 15%			1,264.00
			9,689.00
Say Rs.			9,690.00

(ii) *Raw Materials (including packaging requirements) :*

Particulars	Qty.	Rate	Value
		Rs.	Rs.
Sandal wood	6 metric tons	8100/-	48,600.00
Packaging Material (lump sum)			15,000.00
Total (cost of raw materials)			63,000.00

(iii) *Utilities (per month)*

		Rs.
Power : 50 H.P. L.S.		2,000.00
Steam coal for boiler : 60 tons @ Rs. 250/		15,000.00
(Market rate)		
Water L. S.		600.00
Total		17,600.00

(iv) *Other Contingent Expenses (per month)*

	Rs.
Postage and Stationery	400.00
Telephone and Trunks	1,000.00
Consumable stores	900.00
Repair and maintenance (Machinery equipment & Building)	2,000.00
Travelling expenses	8,000.00
Advertisement and Publicity including sales promotion expenditure	5,000.00
Misc. expenditure	2,000.00
Total (Contingent exp.)	19,300.00

Working Capital (for 3 months) :

$$(i) + (ii) + (iii) + (iv) = 1,10,190 \times 3 = 3,30,570.00$$

4. *Total Capital Investment :*

(i) Recurring	3,30,570.00
(ii) Non-recurring	8,38,120.00
	11,68,690.00

5. *Cost of production (per year)*

(i) Total recurring cost per year	13,22,280.00
(ii) Dep. on machinery and equipment @ 20	71,000.00

	Rs.
(iii) Depreciation on office equipment @20%	3,000.00
(iv) Depreciation on building @ 5%	4,170.00
(v) Interest on total capital investment @15%	1,75,326.00
Total	15,75,776.00
Say,	15,75,780.00

6. *Turn over per year*

Item	Qty.	Rate	Value
		Rs.	Rs.
Sandal wood oil	2880 kg.	800/- per kg.	23,04,000.00
Exhausted sandal wood	7000 tons L.S.		2,000.00
Total			23,06,000.00
Total Turn Over			23,06,000.00

7. Profit per year	(6—5)	7,30,220.00
8. Rate of return	— 62.5%	
9. Brake-even point	— 25%	

10. *Suppliers of Sandal Wood*

Note :—Sandal wood is available presently through auction by Government Agency in the State of Tamil Nadu only. Hence entrepreneurs must in their own interest check up about the prospects of availability of raw materials before deciding to set up this project).

II. *Suppliers of machinery and Equipment :*

1. M/s. A. P. V. Engineering Co. Ltd.,
2, Jessore Road, Dum Dum,
Calcutta-28.
2. M/s. Sweta Gas,
D-1, Industrial Estate,
Bareilly.
3. M/s. Chemical Construction and Co. (P) Ltd.,
57, Ring Road, Lajpat Nagar,
III, New Delhi-24.
4. M/s. Gansons Limited,
6, West View, Dadar,
Bombay-400014.
5. M/s. A. C. C. Vickers Backcock Ltd., (For Boiler)
P. O. Durgapur-6,
Distt. Burdwan.
6. M/s. Chemical Engineering Works,
Ram Mandir Road,
Bombay.
7. M/s. Varsha Boilers (P) Ltd.,
Green House, Green Street,
Bombay-1.
8. M/s. Wester Work Engineers (P) Ltd.,
15, Bhandup Village Road,
Bombay-78.
9. Rank and Co.,
Wazirpur Industrial Area,
New Delhi.
10. M/s. Standard Metal Fabricators Co.,
Naraina Industrial Area,
New Delhi.

(Reserved item Sl. No. 220)

(1) 1,000 kg./month

Basis :

(2) 25 working days in a month.

I. Introduction

During the middle ages, coloured bees wax was used for closing letters and envelopes and for impressing seals on documents. In the sixteenth century, the use of lac in sealing composition was introduced in Europe by spanish merchants. Even today the sealing wax based on lac composition is considered to be better and is in use. Though cheaper quality sealing waxes are made by using pitch, Rosin and fillers like clay, brickdust etc. all medium and high quality sealing waxes contain shellack along with finely ground pigments and dye. As regards colour, red is generally preferred. Only in Posts and Telegraphs departments and Railways Black sealing wax is used.

With the rapid industrialisation and consequent springing up of commercial establishments, the demand for sealing wax is continuously growing.

Process of manufacture of this item is quite simple and it does not require much capital, investment towards land, building and plant. All the raw-materials and equipment can be had locally.

It is, therefore, felt that some small entrepreneurs can take up manufacture of this item in a very modest way with a very small capital investment.

II. Process in Brief

Rosin and Shellack are to be melted and then the fillers are to be added. It is then to be coloured and framed in moulds for plasticity one can add bees wax and castor oil.

Desired characteristics of a sealing wax are:

1. Sealing wax shall be of uniform composition and shall be in the form of sticks.

2. A sealing wax shall be capable of securely adhering to the surfaces where it is desired to affix the seal.

3. A sealing wax shall be capable of taking a clear impression of die with fine inscriptions.

4. A sealing wax shall satisfy the test of heat resistance.

III. Abstract of the Scheme

	Rs.
(a) Accommodation on rent (per month)	150.00
(b) Plant & Equipment	2,750.00
(c) Working capital for 3 months	20,400.00
(d) No. of persons employed—7	
(e) Anticipated turn over per month	8,000.00
(f) Estimated profit per month	975.00

IV. Details

A. Accommodation with covered area 300 s. ft 150.00

B. Plant & Equipment

1. Coal fired oven	1 No.	50.00
2. Melting Pan M. S.	1 No.	100.00
3. Mould with water cooling system	5 Nos.	2,000.00
4. Weighing scale with weights	1 set	100.00
5. Drums, buckets etc. —L.S.		500.00
	Rs.	2,750.00

C. Raw Materials/Month :

1. Shellack	408 kgs. R@s. Rs. 7/- per kg.	2,856.00
2. Rosin	204 kgs. @ Rs. 3.50 per kg.	714.00
3. Filters	408 kgs. @ Re. 0.50 per Kg.	204.00
4. Colours	E. S.	236.00
		4,010.00
	Say, Rs.	4,000.00

D. Staff & Labour

		Rs. p. m.
1. Manager-cum-chemist	1 No.	400.00
2. Workers	4 Nos.	600.00
3. Clerk-cum-store keeper	1 No.	200.00
4. Chowkidar	1 No.	150.00
	Rs.	1,350.00

E. Other Items of Expenditure/Month

	Rs.
1. Fuel (Coal)	50.00
2. Electricity	50.00
3. Packing Material for 1,000 kgs. @ Re. 1/ per kg.	1,000.00
4. Stationery etc.	200.00
	Rs. 1,300.00

<i>F. Working Capital (for 3 Months) :</i>		Rs.
1. Rent		450.00
2. Raw Material		12,000.00
3. Staff and Labour		4,050.00
4. Other items of expenditure		3,900.00
	Rs.	<u>20,400.00</u>

<i>G. Total Capital Investment :</i>		Rs.
(a) Plant and Machinery		2,750.00
(b) Working capital for 3 months		20,400.00
		<u>23,150.00</u>
Say Rs.		<u>23,000.00</u>

Profit and Loss Account per Month :

Cost of :		Rs.	By Sale of :
(a) Recurring expenditure.		6,800.00	1,000 kgs. of sealing wax in 250 grms. packed @Rs. 200/-
(b) Interest on invested capital @ 10 per annum.		200.00	per packet = Rs. 8,000/-
(c) Depreciation on plant and equipment @ Rs. 10/- per annum.		25.00	approx.
(d) Profit		<u>975.00</u>	
Total		<u>8,000.00</u>	

(Reserved item Sl. No. 321)

I. Introduction

Sodium chromate finds applications in leather tanning, in glass pigments, in dyes as mordant in synthesis of other chromium compounds as sodium dichromate etc. and in laboratories. Although the demand of sodium chromate is not much as such and that is why most of the sodium chromate manufacturers are converting it into sodium dichromate or we may say that sodium dichromate is intermediate for the manufacture of sodium dichromate.

The main raw materials for the manufacture of sodium chromate are chromite ore, soda ash and lime. All of these are easily available indigenously. While selecting site for this industry, the easy availability of chromite ore must be considered. Adequate infrastructure is also the key factor.

Plant & machinery required for the manufacture of sodium chromate can be locally fabricated by the machinery manufacturers in the line.

II. Technical Aspects

(i) Process Outlines

The chromite ore is first powdered (200 mesh) and mixed with proportionate amounts of soda ash powder and lime in a mixer. Now this mixture is subjected to heating in rotary kiln furnace in which strong oxidising atmosphere is maintained. The mixture moves downward and gets heated upto 1200°. It is maintained at this temperature for about four hours. By this time chromite ore has been oxidised to sodium chromate.

The sintered mass from the kiln is now discharged from the furnace and is powdered in a hammer mill or pulverised or 150-200 mesh size. Powdered material is then transferred to bleaching tanks, where it is treated with hot water to separate soluble sodium chromate.

The solution (45°Be) is then concentrated in evaporators upto 52°Be when most of the sodium chromate crystallises in the crystalliser which is subsequently isolated by centrifuging. Finally it is dried at 30°C and packed.

(ii) Quality specification

Sodium chromate for industrial use must conform to ISI specification No. IS. 6707-1972 laid down for sodium chromate (technical)

(iii) Production Capacity (per annum) :

Quantity	— 300MT
Value	— Rs. 30,00,000.00

III. Financial Aspects

(i) Land and Building

		Rs.
(a) Land 1000 sq. mt. @ Rs. 15/-	p. m.	15,000.00
(b) Building 600 sq. mt. @200/- divided into office, laboratory works, boiler chamber, stores etc.		1,20,000.00
		<u>1,35,000.00</u>

(ii) Plant & Machinery (all indigenous)

Designation	No.	Value
		Rs.
1. Rotary kiln furnace electrically heated, fabricated from 15 mm. MS plated outside shall mounted on el-wheels rails. It should be withdraw oxidely for the purpose of inspection and change of heating element etc. Power input—60 KW, working temperature—1250°C Holding capacity—600 Kr.	One	1,95,000.00
2. Pulverizer with motor and other accessories, capacity 200 Kl per hour (200 mesh)	One	20,000.00
3. Mixer made of M. S. with motor and other accessories	One	10,000.00
4. Jaw crusher, capacity 1 MT/day with motor etc.	One	10,000.00
5. Bleaching tank MS lead lined capacity 1000 gre with heating arrangement	Two	18,000.00
6. Settling tank MS lead lined capacity for 500 line	Three	15,000.00
7. Evaporators MS lead lined dia 36" × 10" (deep)	Five	25,000.00
8. Coal fired furnace with chimney etc. upper dia 30" made of bricks	3 Nos.	15,000.00

9. Crystallisers, with cooling arrangements cap. 2000 litre	One	Rs. 15,000.00
10. Centrifuge basket type with 5 HP motor M. S.	One	15,000.00
11. Electrically heated drier 24 aluminium trays with trally etc.	One	20,000.00
12. Weighing scale dial type	One	5,000.00
13. Water arrangement with deep tubewell, over head tank, pump etc.	One	10,000.00
14. Miscellaneous tools and equipments	One	5,000.00
15. Quality control equipments including drying chamber, hot water bath, water distillation plant, chemical balance, and glass apparatus	L.S.	10,000.00
16. Electrical equipments :		
(i) 1000 KVA, 11 KV/430 V Indoor pattern floor mounting type transformer	One	20,000.00
(ii) L. T. distribution board with feeder & switch etc.		20,000.00
(iii) H. T. Installation switch board, including wiring of different equipments		10,000.00
17. Office equipment & Working tables		10,000.00
		4,58,000.00
Installation & Electrification charge @ 15 %		69,000.00
		5,27,000.00

A. Fixed Capital
Land & Buildings + Plant & Machinery
= Rs. 1,35,000.00 + 5,27,000.00
= Rs. 6,62,000.00

B. Working Capital (per month)

(i) Personnel
Administrative & Office

Manager	One	1,500.00
Sales Manager	One	1,200.00
Accountant/clerk	One	600.00
Peon	One	200.00
Darwan/Watchman	Two	500.00

Technical

Manufacturing Chemist	One	1,200.00
Analyst	One	700.00
Skilled Worker	10	3,000.00
Unskilled Workers	15	3,000.00
Peon	1	200.00

Addition 20% perquisites of salaries

12,100.00
2,400.00
14,500.00

(ii) Raw Materials

Item	Qty.	Rate	Value
			Rs.
1. Chromite ore	45 MT	1,200/-	54,000.00
2. Soda ash	25MT	2,200/-	55,000.00
3. Lime stone	35 MT	400 -	14,000.00
4. Packing materials (Steel drums 50 Kg. cap.)	50 Nos.	80/-	4,000.00
			1,27,000.00

(iii) Utilities (per month)

Electricity — 62 KW × 24 hrs × 25 days = 37,200 Kwh
@30/- = Rs. 8,000/-

Fuel, steam, coal 30 MT @ 200 Rs.
= Rs. 6,000/-

Total Rs. 14,000/-

(iv) Contingent expenses (per month)

	Rs.
1. Consumable stores Machine oil, gear oil, grease oil etc. Miscellaneous tools etc.	2,000.00
2. Repairs/maintenance	1,000.00
3. Postage/Stationery/Telephone	1,000.00
4. Advertisement/Publicity & Sales promotion	3,000.00
5. Transport/conveyance	2,000.00
6. Misc. expenses	1,000.00
	10,000.00

(v) Total working expenses (per month) :

(i)+(ii)+(iii)+(iv)
= 14,500/- + 1,27,000/- + 14,000/- + 10,000/-
= Rs. 1,65,500/-

Working Capital for 3 Months

Rs. 1,65,500.00 × 3 = Rs. 4,96,500.00

C. Total Capital investment :

Rs. 6,62,000.00 + Rs. 4,96,500.00
= Rs. 11,58,500.00 (Say Rs. 11,59,000.00)

D. Production Cost per annum :

	Rs.
Recurring expenditure	19,86,000.00
Interest @ 15% per annum	1,73,000.00
Depreciation on machinery @ 10 %	51,000.00
Depreciation on Building or shed @ 5%	6,000.00
Depreciation on furniture & fixture @ 20%	2,000.00
	22,19,550.00
Say, Rs.	22,20,000.00

E. Turnover per annum

Sodium chromate 300 MT @ 10,000/- per MT	30,00,000.00
Sales commission @ 10%	3,00,000.00
	27,00,000.00

F. *Net Profit per annum (before taxation)*
Rs. 27,00,000·00 — Rs. 22,20,000·00 = Rs. 4,80,000·00

G. *Return* = 41·3%

H. *Break even point* = 40·5%

Suppliers of Raw Materials :

1. M/s. Tata Chemicals, Mithapur.
2. M/s. Orissa Mining & Metal Development Corp., Bhubaneshwar.
3. M/s. D. C. M. Chemical Works, Delhi.

4. M/s. Bengal Chemicals and Pharmaceutical Works, Calcutta.

Suppliers of Machinery & Equipment

1. M/s. A. P. V. Engineering Co., Jessore Road, Calcutta-28.
2. M/s. Bhaskar Engineers, Behala Calcutta-32.

(Reserved item Sl. No 286)





SODIUM/POTASSIUM IODIDES AND SODIUM/
POTASSIUM CITRATES*

I. Introduction

Sodium/Potassium Iodides are used in the laboratory for Iodometric analysis. It finds use in pharmaceutical industry in the form of tinctures and ointments.

Sodium/Potassium Citrates are used in the pharmaceutical industry for syrups etc.

Sodium/Potassium Iodides and Sodium/Potassium Citrates have been clubbed together in this scheme, since the machinery and equipments for these items is almost the same and both are having the same pharmaceutical and uses.

In the scheme herewith economics have been calculated for Potassium Iodides and Potassium Citrates. The process of manufacture and economics of the unit of Sodium Iodides and Sodium Citrates would be almost similar.

II. Technical Aspects

(a) Process outline

Sodium/Potassium Iodides

Caustic potash is dissolved in water and calculated amount of Iodine is added slowly to the solution, when Potassium Iodide and Potassium Iodate are formed. To the solution activated carbon is added and the mixture is heated to 80°C. Potassium Iodate gets reduced to Potassium Iodide.

The solution is filtered and again heated to saturation. The saturated solution is allowed to cool and later is centrifuged. The crystals thus obtained are dried at 90°C, sieved and packed in polythene bags and sold in fibre drums.

Similarly Sodium Iodide can be manufactured by using caustic soda.

Sodium/Potassium Citrates

Citric acid is dissolved in water and neutralised with potassium carbonate or caustic potash till effervescence ceases. The solution is filtered and concentrated by evaporation. The

*Tartarates can also be manufactured with the provisions made in the scheme except in regard to raw materials.

concentrated solution is allowed to cool and the crystals are obtained. The crystals are centrifuged and dried at 60°C. They are packed in polythene bags and sold in 50 Kg. fibre drums.

For manufacture of Sodium Citrate similar procedure is followed and sodium carbonate or caustic soda are used instead of potassium carbonate or potash.

(b) Quality and specifications

Sodium/Potassium Iodides	I.P. Grade.
Sodium/Potassium Citrates	I.P. Grade

(c) Production Capacity (Per annum)

(i) Quantity	Potassium Iodide 6 Tons	Potassium Citrate 48 Tons	Total 54 Tons
(ii) Value	7,20,000	12,48,000	19,68,000

III. Financial Aspects

1. Fixed capital

(i) Land & Building

			Rs.
Land	2200 sq. meters	Rented	600-00
Built area office, stores etc.	30 "		
Laboratory	30 "		
Working shed.	100 "		
			600-00

(ii) Machinery & Equipment

(a) Production Units

Sl. No.	Description	Indigenous	Qty.	Price (Rs.)
1.	Reaction Vessel S.S. 4' Dia x 5' Jacketted with steam inlet/outlet-stirrers motor 1.5 H.P.	Indigenous	1	20,000-00
2.	S.S. Vessels with tap 4' Dia x 5'	"	2	8,000-00
3.	Baby Boiler-steam rating 100 Kg. per hour oil fired with pump.	"	1	20,000-00
4.	Concentration Tank S.S. 6' Dia x 3' with silica immersion heaters with motor stirrer 1.5 H.P.	"	1	20,000-00
5.	Filtration unit Buchner Type S.S.	"	1	10,000-00
6.	Vacuum pump	"	1	8,000-00

7. Dryer-Tray type S.S. Trays—2' × 3' × 2"—48 Nos. with heater elements—Aircirculation fan 1.5 H.P. with temp. control	Rs.	
8. Weighing Balance	1	20,000·00
9. S.S. Sieves 2' × 3' × 2" Motorised shaker 1.0 H.P.	1	5,000·00
10. Ion Exchange Column Three cylinders—with water pump	1	8,000·00
(b) Testing Equipment : Quantitative/qualitative Testings PH meter, Drying over Chemical balance etc.	—	20,000·00
(c) Electrification & Installation charges @ 10% of cost of machine and equipment		14,100·00
Total cost of machinery & equipment etc.		1,55,100·00
Say		1,55,000·00
(ii) Cost of office equipment/working tables etc.		20,000·00
Total fixed capital (ii), (iii)		1,75,000·00

(2) Working Capital (per month)

(i) Personnel :

Designation	No.	Salary	Total (Rs.)
(Administrative & Supervisory)			
Manager	1	1000	1,000·00
Chemist (Analyst)	1	800	800·00
Clerk	1	500	500·00
Chowkidar	1	300	300·00
Peon	1	200	200·00
(Technical-skilled & unskilled)			
Production Chemist	1	900	900·00
Supervisor	1	800	800·00
Skilled workers	2	400	800·00
Unskilled workers	5	300	1,500·00
Total (Salaries)			6,800·00
(+) Perquisites @ 15% of salaries			1,020·00
Total			7,820·00

(ii) Raw materials including packaging requirements (per month)

Particulars	Indigenous/ imported	Qty.	Rate	Value (Rs.)
1. Caustic Potash	Indigenous	305 Kgs	Rs. 8 per Kg.	2,440·00
2. Activated Carbon	Indigenous	22 Kgs.	Rs. 10 per Kg.	220·00

3. Iodine	Imported	435 Kgs.	Rs. 110 per Kg.	47,850·00
4. Citric Acid	Indigenous	3080 Kgs.	Rs. 24 per Kg.	43,120·00
5. Potassium Carbonate anhydrous	Indigenous	3370 Kgs.	Rs. 8 per Kg.	26,960·00
6. Packing material Fibre drums 50 Kgs. Cap.	Indigenous	90 Nos.	Rs. 35/- each	3,150·00
Polythene Bags	"	—	—	260·00
				1,24,000·00

(iii) Utilities (per month)

Power 200 KWH units @ 50 paise per unit	Cost (Rs.)	100·00
Fuel (furnace oil) 5 tonnes @ Rs. 1100 per ton		5,500·00
Total cost of utilities		5,600·00

(iv) contingent expenses (per month)

	Rs.
Rent (where cost of land & building is not specified).	600·00
Postage & Stationery	300·00
Telephone	300·00
Consumable stores	300·00
Repairs & Maintenance	500·00
Transport Charges	200·00
Advertisement & Publicity	580·00
Miscellaneous Expenditure laboratory chemicals etc.	1,800·00
	4,580·00

(v) Total recurring Expenditure (per month):

Personnel	7,820·00
Raw Materials	1,24,000·00
Utilities	5,600·00
Contingent expenses	4,580·00
	1,42,000·00

(vi) Total working capital (on 3 months basis)	1,42,000·00 × 3
	4,26,000·00

3. Total Capital Investment

(i) Fixed Capital	1,75,000·00
(ii) Working Capital	4,26,000·00
Total (i) + (ii)	6,01,000·00

4. Cost of Production (Per Year)

	Rs.
Total recurring cost per year	17,04,000·00
Depreciation on machinery & equipment @10%	15,500·00
Depreciation on office equipment @ 20%	4,000·00
Interest on total investment @ 15%	90,150·00
Total Cost of Production	18,13,650·00

5. Turn-over (per year)

Item	Qty.	Rate	Value (Rs.)
Potassium Iodide	6 Tons.	120 Kg.	7,20,000-00
Potassium Citrate	48 Tons.	26 per Kg	12,48,000-00
Total Turn-over			19,68,000-00
Net. Profit per year (5-4) (before Income-Tax)			1,54,350-00
7. Rate of Return			= 25.7%
8. Break-even Point (% of total production envisaged			= 44%

9. Addresses of Machinery & Equipment Suppliers.

1. M/s. Jayems Engineering Co.,
130/132, Apollo Street, Bombay-400 023.
2. M/s. Madras Industrial Zinings Ltd.
25, Gilchrist Avenue, Hawington Road,
Madras-600 003.
3. M/s. Dalco Engineering Pvt. Ltd.,
H.A. Ltd., Compound,
Pimpri-Poona-411 018.
4. M/s. Gohel Chemical Engineering Works,
Near Chakodiya Mahadev, Rakhial, Ahmedabad-23.
5. M/s. Gopal Machine Tools,
L-111/112, GIDC, Odhav, Ahmedabad-382415.
6. M/s. Chemtex Engg. Enterprises,
L-17, GIDC, Odhav-382415.
7. M/s. Pharmalab Industries,
Star Metal Compound, Lal Bahadur Shastri Marg,
Vakhroli, Bombay.
8. M/s. D. Parikh Engineering Works,
115, Marol Ind, Estate,
Near Saki Naka, Bombay-59.
9. M/s. India Equipment Corporation
Andheri East, Bombay-93.
10. M/s Gujarat Machinery Manufacturers Ltd.,
Churchgate Chambers, 32, 34, Veer Nariman Road,
Bombay-23.

10. Addresses of Raw Material suppliers

1. Activated Carbon:

1. M/s. Ramada Valley Chemical Corp. Ltd.,
Rajpipla, Dist. Broach, Gujarat.

2. M/s. Patco Industries,
Rajpipla, Dist. Broach, Gujarat.

2. Citric Acid

1. M/s. Citric India Ltd.,
Nasik, Maharashtra.

2. M/s. Citurgia Biochemicals Ltd.,
Pandesara
Surat. (Gujarat)

3. Potassium Carbonate and Caustic Potash

1. M/s. Standard Alkali,
Standard Mills Co. Ltd.,
Chemical Division,
Mafatlal Centre, Nariman Point, Bombay-400 021.

4. Iodine—Imported—Canalised through CAPCO

5. Packing Drum

1. M/s. Apurva Containers,
Chamunda Charasta,
Naroda Road,
Ahmedabad.

2. M/s. Crown Containers,
Gujarat V.M. Estate,
Odhav,
Ahmedabad.

3. M/s. Dimple Drums,
Barrels (P) Ltd.,
Gulsunda Village, Rassayam-Kolaba.

4. M/s. Rumi Plastics,
8-A, Indian Metal Forging Rolling Mills Compound,
L.B. Shastri Marg, Vikhroli-West,
Bombay-400 083.

(Reserved item Sl. Nos. 282, 283, 232, 233, & 234)

I. Introduction

Latex is used for making a considerable variety of rubber products ranging from gas decentamination gloves and electrician's gloves to surgical gloves/tubing and toys for infants. With the advancement in industrialisation and emphasis on medicare and opening of more and more hospitals/clinics demand for industrial gloves/surgical gloves may grow at a faster rate.

The raw materials, machinery and equipment as well as technology for the manufacture of industrial gloves/surgical gloves is indigenously available. India being one of the leading producers of natural rubber, there exists a good potential for creating additional manufacturing capacity for the manufacture of latex (Rubber) gloves, both for home consumption as well as for export market.

II. Technical Aspects

(a) Process Outline

The process of manufacture consists of following operations;

- (i) Reduction of ammonia content in latex to about 0.1% by blowing air or by reacting with formaldehyde.
- (ii) Preparation of emulsion/dispersion of various additives to be added in latex compound.
- (iii) Compounding of latex by adding requisite quantities of rubber chemicals/dispersions.
- (iv) Preparation of coagulant solution.
- (v) The former which is made of aluminium, wood, glass or porcelain is dipped in coagulant solution and then into latex compound. It is necessary to have uniformity in immersion and withdrawal rates. After withdrawal of the former the flow may be controlled, by rotating the former to assure even distribution of deposited latex films.

(vi) Leaching, drying, preliminary finishing operation such as beeding.

(vii) The article is then cured in hot air or steam.

A typical composition of latex rubber compound for surgical gloves is as under :

60% Natural Rubber Latex	100 kgs.
Vulcanox S.P. emulsions 50%	2
Emulvin T solution 20%	1
Zinc oxide active dispersion	0.25
Colloidal sulphur dispersion	0.8
Vulcacinit LDA dispersion	0.6

(b) Quality Specification :

Surgical Rubber Gloves—IS-4148-1967

Rubber Gloves for electrical purpose—IS—4770-1968

(c) Production Capacity (per annum/Shift)

	Rs.
(i) Quantity	4,60,000 pairs
(ii) Value	6,90,000.00

III. Financial Aspects

1. Fixed Capital

(i) Land & Building

	Rented Rs.
Land	250 sq. metre
Built up area	
(details as under)	80 sq. metre
Working shed	60 sq. metre
Office accommodation	20 sq. metre
	800.00

(ii) Machinery & Equipment

(a) production unit

	Rs.
1. Deammonising vessel 100 lit. cap. fitted with stirrer & motor 0.5 h.p.	1 No. 2,000.00
2. Pot Mill with two 4 jars each of 10 lit. cap. fitted with reduction gear & motor of 1 H.P.	1 No. 3,000.00
3. High speed mixer capacity 5 lit. with 0.5 HP motor.	1 No. 2,000.00
4. Planetary mixer made of stainless steel, SS 304 QU AISI, cap. 150 lit. heart shaped beater, fitted with 2 Hp motor	1 No. 5,000.00

	Rs.
5. Dipping vat, 100 lit. capacity with covers fitted with automatic arrangement for dipping withdrawing the former 2 Nos.	10,000.00
6. Hot air oven, 5' x 3' x 4' electrically heated with 12 trays fitted with air circulation pump 1 No.	5,000.00
(b) Testing equipment weighing balance, micrometer, hardness tester	5,000.00
(c) Electrification & installation charges @ 10% of cost of machinery & equipment	3,200.00
	<u>35,200.00</u>
(iii) Cost of formers and hand tools	5,000.00
(iv) Office equipment & working table	5,000.00
(v) Pre-operative expenses	800.00
Total (Machinery & equipment)	<u>46,000.00</u>

2. Working Capital (per month)

(i) Personnel

Administrative & Supervisory Staff

	Rs.
Production Supervisor 1 No. @ Rs. 1000	1,000.00
Accountant Asstt./storekeeper 1 No. @ Rs. 500	500.00
Salesman 1 No. @ Rs. 400	400.00
Chowkidar/peon 1 No. @ Rs. 200	200.00

Technical Staff

Skilled Workers 3 Nos. @ Rs. 400	1,200.00
Unskilled workers 4 Nos. @ Rs. 250	1,000.00
Perquisites @ 15% of salaries	650.00

Total (personnel) 4,950.00

(ii) Raw Materials etc.,

	Rs.
60% Natural Rubber latex 2500 kgs. @ Rs. 9/kg	22,500.00
Vulcanox SP 25 kg. @ Rs. 20/kg.	500.00
Emulvinal 5 kg. @ Rs. 20/-kg.	100.00
Zinc oxide 6.25 kg. @ Rs. 13/kg	82.00
Colloidal sulphur 20 kg. @ Rs. 80/kg.	1,600.00
Vulcancity LDA 15 kgs. @ Rs. 35/kg	525.00
Oleic acid 112 kg. @ Rs. 18/kg	2,016.00
Caustic soda 25 kg. @ Rs. 3/kg.	75.00
Calcium chloride 100 kg. @ Rs. 3/kg.	300.00
Acetic acid 250 kg. @ Rs. 6/kg.	1,500.00
Methyl Alcohol 2000 kg. @ Rs. 3/kg	6,000.00
Packaging material viz. polythene bags and paper cartons.	4,500.00
Total (Raw materials)	<u>39,700.00</u>

(iii) Utilities

	Rs.
Power 750 KWH @ Rs. 0.30 per KWH	225.00
Water 100 K: @ Re. 0.70 per Kg	70.00
Total (Utilities)	<u>295.00</u>

(iv) Contingent Expenses:

	Rs.
Rent	800.00
Postage & Stationery	200.00
Consumable stores	250.00
Repairs & maintenance	250.00
Transport charges	200.00
Advertisement & Publicity	200.00
Taxes.	100.00
Total (contingent expenses)	<u>2,000.00</u>

(v) Total Recurring Expenses (per month)

	Rs.
Personnel	4,950.00
Raw Materials	39,700.00
Utilities	295.00
Contingent expenses	2,000.00
Total	<u>46,945.00</u>
Say:	<u>47,000.00</u>

(vi) Total Working Capital for (three months) 1,41,000.00

3. Total Capital Investment

	Rs.
(i) Fixed Capital	46,000.00
(ii) Working capital (for 3 months)	1,41,000.00
Total (Capital Investment)	<u>1,87,000.00</u>

4. Cost of Production (per year)

	Rs.
Total recurring cost per year	5,64,000.00
Depreciation on machinery @ 10%	3,520.00
Depreciation on moulds @ 25%	1,220.00
Depreciation on furniture @ 20%	1,030.00
Interest on total investment @ 15%	28,000.00
Total	<u>5,97,770.00</u>
Say:	<u>5,98,000.00</u> (say)

5. Turn-over per year

Surgical gloves 4,60,000 pairs @ 1.50 per pair	6,90,000.00
6 Profit per year (5-4) (6,90,000—5,98,000) =92,000	

7. Rate of Return :

=49%

8. Break-even Point :

=45%

Addresses of Suppliers of Machinery & Equipment

1. M/s. Kilburn & Co,
2, Fairlie Place,
Calcutta-1.
2. M/s. Ganson & Co.
Industry Manor
Offi-Soharkar Marg,
Bombay-25.
3. M/s. Andhra Scientific Co.,
4, Blackore Road, Mount Road,
Madras. 2.
4. M/s. Kusum Engg. Works,
25, Swallow Lane, Calcutta-1.
5. M/s. Richardson & Cruddas Ltd.
Byculla, Bombay-8.

Suppliers of Raw Materials

1. M/s. ICI India Pvt. Ltd.,
P.O. Box No. 310, Crescent House,
Ballard Estate, Bombay-1.
2. M/s. Bear India Ltd., Nagin Mahal,
Veer Narian Road, Bombay-1.
3. M/s. Monsanto Chemicals (India) Pvt. Ltd.,
Wakefield House, Sprott Road,
Bombay.
4. M/s. Kamani Metallic Oxides Pvt. Ltd.,
Nicols Road, Kamani Chambers, Bombay-1.
5. M/s. Plantation, Corporation, of Kerala Ltd.
Chempara Thimopttilsa,
Nagapadam, Kotiayam-6.
6. M/s. Bayer (India) Ltd.,
Nagin Mahal, Veer Nariman Road,
Bombay-1.

(Reserved item Sl. No. 108)





I. Introduction

Rubber based adhesives find a wide variety of applications in industry on account of its versatile properties and ease for formulation with a variety of modifiers like tackifiers, fillers, plasticizers, curing agents etc. The material for such adhesives is an elastomer which may be natural rubber or synthetic rubber like Neoprene, Isobutylene, SBR, Acrylo Nitrite etc.

These adhesives find applications for bonding rubber to rubber, rubber to leather and rubber to plastic etc.

Rubber adhesives have good export potential.

II. Technical Aspects**(a) Progress outline**

The formularies for rubber adhesives vary with the end use but the manufacturing process remains the same. The rubber and all the compounding ingredients are worked in on a rubber mill. The mastication time and order of mixing ingredients vary with the type of rubber used. It is very important to standardise mixing procedure and conditions to avoid gelling of whole adhesive mass. Extreme cleanliness should be observed in handling raw materials to avoid foreign particles.

After mixing the rubber compound, it is cut into small pieces and transferred to dough mixer along with solvent mixture. Generally 2-3 hours are required for a batch of 150 kg. The dough (thick solution) thus formed can be diluted to desired viscosity. Fords cup is ideal to accurately determine viscosity. Tackifiers may be dissolved in the solvent and added to the dough of rubber compound.

(b) Quality Specifications :

There are different specifications for rubber adhesives used by different industries such as automobile, tyres and tubes, footwear etc. A good equipped testing laboratory is essential to maintain quality and also for the developmental work.

(c) Production Capacity (Annual/shift)

- (i) Quantity 60, 000 litres
(ii) Value Rs. 6,50,000.00

III. Financial Aspects:**1. Fixed Capital****(i) Land & Building:**

Land	500 sq. m.	
Built area		
(i) Office stores etc.	100 sq. m.	} with provision for solvent storage.
(ii) Working Shed.	200 sq. m.	
Rented @ Rs. 1000/- p.m.		

(ii) Machinery & Equipment

	Rs.
1. Mixing Mill (size 12" x 30" with reduction gear starter & 30 HP Motor (1)	40,000
2. Sigma type blender and kneader size 16" x 16" x 20" with electric motor and (stainless steel lined) blades 7.5 HP motor (1)	15,000.00
3. Small pulveriser with 2 H.P. Motor (1)	1,500.00
4. Batch type ball mill with porcelain pots & without ball (six pots with electric motor 5 H.P.) (1)	6,000.00
5. M.S. Mixing tanks, 2 mm thick, 3' dia and 3' high. (3)	1,500.00
6. Storage tanks 500 litres. capacity (3)	1,500.00
7. Trolleys, fire extinguishers etc. (1)	1,000.00
8. Platform Weighing balance (250 kg. cap) (1)	5,000.00
9. Ordinary balance (1)	500.00
10. Laboratory equipments.	
(a) Tensile testing machine	
(b) Fords cup	
(c) Chemical balance	10,000.00
(d) Misc.	
11. Erection & Electrical installation	8,000.00
12. Furniture & Fixture.	5,000.00
13. Pre-operative expenses	5,000.00
Total (Machinery & Equipment)	1,00,000.00
Total Fixed Capital	1,00,000.00

2. Working Capital (Per Month)

(i) Personnel

	Rs.
1. Manager/Chemist 1 No.	500.00
2. Clerk/Typist 1 No.	300.00
3. Skilled labour 1 No.	300.00
4. Unskilled labour 3 Nos.	450.00
5. Watchman 1 No.	150.00
	1,700.00
Add about 15% perquisites	300.00
Total (Personnel)	2,000.00

(ii) Raw Materials etc.

	Rs.
1. Natural rubber RMA-300 kgs. . @ 9/kg.	2,700.00
2. Neoprene Wx. 100 kgs. @ Rs. 20/kg.	2,000.00
3. Neoprene AD 100 kgs. @ Rs. 20/kg.	2,000.00
4. Tackifier (Phenolic) 350 kgs. @ Rs. 20/lg	7,000.00
5. Solvent Toluene 1750 lts. @ Rs. 4.50/lit	7,875.00
6 Solvent ethyl acetate 750 lits. @ Rs. 7/lits	5,250.00
7. Solvent Gasoline 2500 lits. @ Rs. 1.50/Lit.	3,750.00
8. Filler 325 Kgs.s@ Re. 1/Kg.	375.00
9. Rubber chemicals 90 Kgs. @ Rs. 15/Kg.	1,330.00
10. Packaging labels	
Tin Cans	
20 Lit. cap. 125 nos	} 5,000
5 lit. cap. 200 nos.	
2 lit. cap. 750 nos.	
Total (Raw Materials etc.)	37,250.00

(ii) Utilities

	Rs.
1. Electricity 3750 KWH units @ Re 0.25/	
unit	940.00
2. Water 250 KL.	125.00
Total (Utilities)	1,065.00

(iv) Other Contingent expenses

	Rs.
1. Rent	1,000.00
2. Postage and stationery	100.00
3. Telephones	200.00
4. Consumable stores & repairs & maintena-	
nce.	300.00
5. Transport charges	500.00
6. Advertisement and Publicity	100.00
7. Insurance @ 1%	75.00
8. Sales expenses	200.00
9. Miscellaneous	50.00
Total (Contingent expenses)	2,525.00

V. Total Recurring Expenses (per month) 42,840.00

vi. Working Capital (for 3 months) 1,28,520.00

3. Total Capital Investment

	Rs.
Fixed Capital	1,00,000.00
Working Capital	1,28,520.00
	2,28,520.000
Say	2,28,500.00

4. Cost of Production (per year)

	Rs.
Total recurring cost per year	5,14,080.00
Depreciation on machinery and equipments	
@ 10%	8,200.00
Depreciation on furniture @ 20%	1,000.00
Interest on total investment @ 15%	34,270.00
	5,57,550.00

5. Turnover (per year)

	Rs.
(a) 24,000 literes of Neoprene adhesive @ Rs.	
15/lit.	3,60,000.00
(b) 36,000 lit. of natural Rubber adhesive	
@ Rs. 8 per lit.	2,88,000.00
	6,48,000.00
Less Sales commission @ 5%	32,400.00
	6,15,600.00

6. Profit per year (5-4) 58,050.00

7. Rate per return 25%

8. Break-even point: 45%

Addresses of Machinery manufacturers:

1. Sohal Engineering Works, Lalbahadur Shastri Marg, Bandup, Bombay-78.
2. Indian Expeller Works, Naroda Industrial Estate, Naroda, Ahmedabad-2.
3. Richardson and Cruddes Ltd, Byculla Iron Works, Sir J.J. Road, Byculla, Bombay-8.
4. G.G. Engg. Works, Mohib Safed Pool, Kurla Andheri Road, Bombay-72.
5. M/s. Bravo & Co. 108, Patvarbagan Lane, Calcutta-19.

Typical Adhesive Formularies

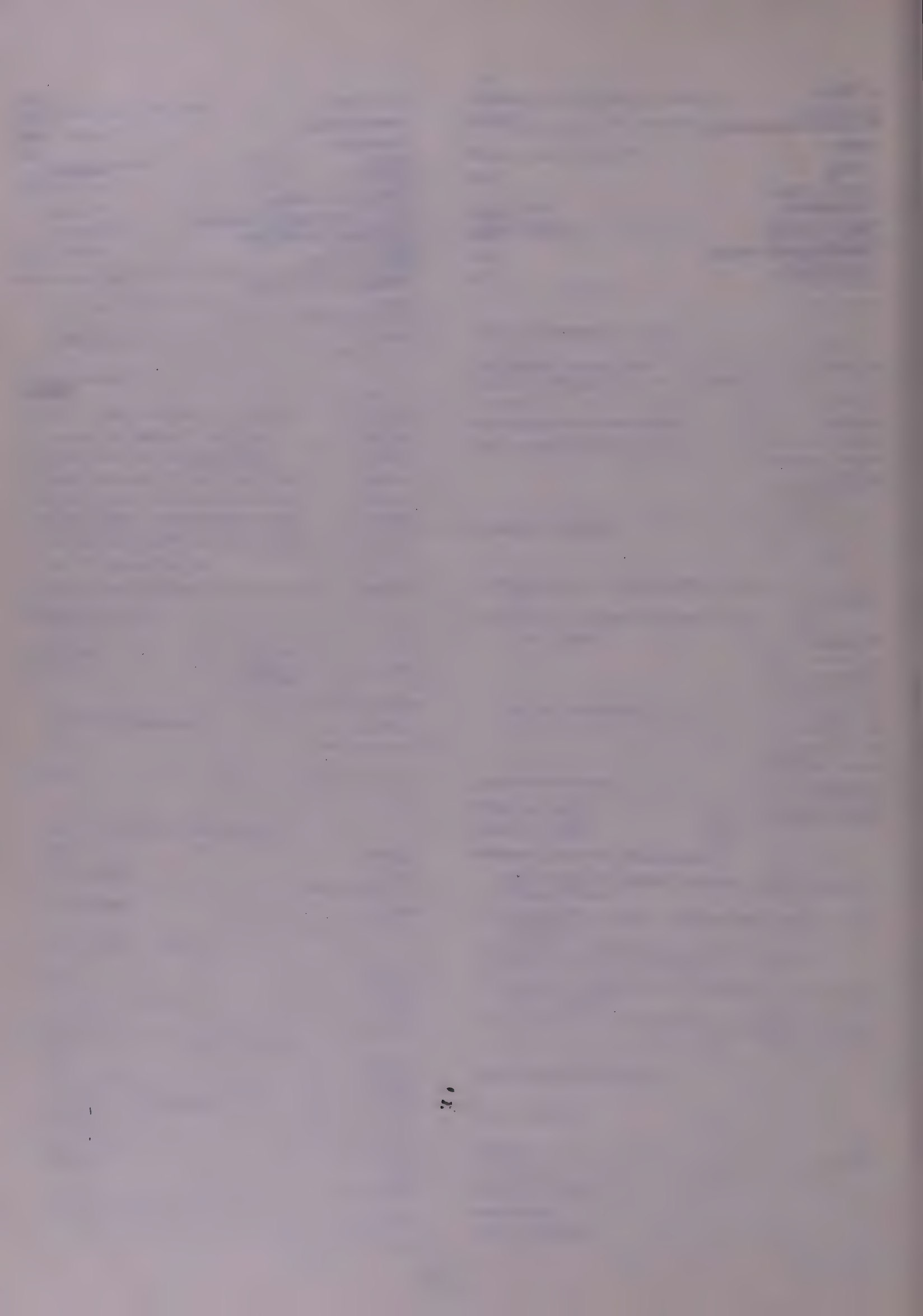
Natural Rubber

	Rs.
RMA-1	100.00
Zincoxide	5.00
Antioxident PBWA	1.00
Stearic Acid	1.00
Calcium Carbonate	50.00

C.I Resin	Rs.
Solvent mix	100.00
For curable adhesive ADD	1,000.00
MBTS	1.5
Sulphur	2.00
Neoprene Rubber	
Neoprene WX	50.00
Neoprene AD 40	50.00
Light Magnesium Oxide	4.00
Antioxidant 3 B	1.50

Zinc Oxide	Rs.
Calcium Silicate	5.00
Stearic Acid	15.00
	0.50
C.I. Resin	10.20%
Toluene+ Esso solvent	
1425 + Ethyl Acetate 1000 CCS	
For curable Adhesive Add	
NA 22	0.5
TMT	1
(Reserved item Sl. No. 326)	

●●●



I. Introduction

Paper conversion products find extensive usage in various house-hold, industrial, commercial, educational and other specialised activities. In communication, teleprinters are the most important link for transmitting messages. M/s. Hindustan Teleprinters Ltd. are reported to be manufacturing nearly 6000 teleprinter machines every year. Thus the increase teleprinter machines and their usage is resulting in a corresponding increase in the requirements of teleprinter rolls.

Besides, teleprinter rolls, adding machines also requires paper rolls for feed. These can also be manufactured on the same complement of machinery and equipment as for teleprinter rolls.

II. Technical Aspects

(a) Process Outlines

Paper rolls are fed to the slitting machine where the circular cutting knives are arranged according to the thickness of tape/Rolls required. These are rolled to the required diameter size on the papercones.

(b) Quality Specifications etc.

As per customer's specification.

(c) Production Capacity (Per annum) on single shift basis :

(i) Quantity—Rolls of various quality—3,36,000 Nos.

(ii) Value—Rs. 19,11,000/-

III. Financial Aspects

1. Fixed Capital

(i) Land and Building

Land Built area

Office, Stores etc.

Working Shed.

50 sq. metres

250 sq. metres
(Rented)

(ii) Machinery and Equipment

(a) Production Unit :

1. Slitting-cum-tape making machine with a set of 60 cutters complete with motor, Accessories etc.	1	Rs. 52,000.00
--	---	------------------

2. Teleprinter roll rewinding machines for single & multi plies	2	Rs. 20,000.00
3. Adding Machine Rolls making machine	1	8,000.00

(b) Testing Equipments

Physical balance, Calipers, scales etc.	1,000.00
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(c) Installation and Electrification charges @ 10% of the machinery cost	8,000.00
--	----------

89,000.00

(iii) Tools, dies etc.	3,000.00
------------------------	----------

(iv) Office equipments/Furniture/racks	3,000.00
--	----------

95,00.00

2. Working Capital (per month)

(i) Personnel

(a) Admn. and Supervisory Staff :

Manager	1 @ Rs. 800	800.00
Accountant	1 @ Rs. 400	400.00
Typist/Clerk	1 @ Rs. 350	350.00
Salesman	1 @ Rs. 350	350.00
Peon/Chowkidar	1 @ Rs. 200	200.00

(b) Technical Staff :

Skilled Workers	4 Nos. @ Rs. 350	1400.00
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Unskilled Workers	10 Nos. @ Rs. 250	2500.00
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Total 6,000.00

Perquisites @ 15% of the Salary & Wages 900.00

6,900.00

(ii) Raw Materials (including Packaging requirements)

White Paper 15 m. Tonnes @ Rs. 6000/- per ton.	Rs. 90,000.00
Carbon Paper for Multiple Ply Rolls 2,18,750 Meter @ Rs. 12/- per hundred metres	26,250.00
Carbon Paper for Adding Machine Rolls 1,05,000 m. @ Rs. 3/- per hundred metre	3,150.00
Card Board Cores 17,500 Nos. @ Rs. 24/- per hundred	4,200.00
Plastic Plugs 35,000 Nos. @ Rs. 6/- per hundred	2,700.00
Card Board Boxes. 2100 Nos. @ Rs. 2/- each	4,200.00
	1,30,000.00

(iii) *Utilities*

	Rs.
Power 1250 KWH @ Rs. 0/30 per Unit	375.00
Fuel, Water etc.	25.00
	400.00

(iv) *Contingent Expenditure*

	Rs.
Rent	1,500.00
Postage & Stationery	200.00
Telephones	50.00
Consumable Stores	100.00
Repair & Maintenance	100.00
Transport Charges	500.00
Advertisement & Publicity	500.00
Insurance	250.00
Miscellaneous	500.00
	3,700.00

3. *Total Recurring Expenditure*

	Rs.
Staff & Labour	6,900.00
Raw Materials	1,30,000.00
Utilities	400.00
Contingent Expenses	3,700.00
	1,41,000.00

Rs.

Total Working Capital for 2 months	2,82,000.00
<i>Total Capital Investment</i>	
Fixed Capital	95,000.00
Working Capital	2,82,000.00

Total (Capital Investment) 3,77,000.00

Cost of Production (Per annum)

	Rs.
Recurring expenditure (per annum)	16,92,000.00
Depreciation on Mach. & Equipment @ 10%	8,800.00
Depreciation on Tools, Moulds etc. @ 25%	750.00
Interest on Capital Investment @ 15%	56,500.00
	17,58,700.00

Turn Over (per Annum)

	Per unit
Single Ply Rolls 1,05,000 @ Rs. 6/50	6,82.500
Multiple Ply Rolls 1,05,000 @Rs. 8/50	8,92,500.00
Telegraph Tapes 84,000 @ Rs. 3/-	2,52,000.00
Adding Machine Rolls 42,000 @ Rs. 2/- (Single Ply)	84,000.00
	19,11,000.00

Net Profit (Per year)	1,52,300.00
Rate of Return 40.4%	
B.E.P. 46%	

Reserved item Sl. Nos. 68 and 69

I. Introduction

Fluids at low pressures are usually transported from one place to another in flexible tubings which are generally known as delivery tubes. Tubes are used to convey water. Corrosive chemicals and even gases for burners. Rubber tubings are most popular because of their low cost as well as inertness to most of the materials which are conveyed. They are also very flexible and easy for handling. The rubber compounds for the manufacture of tubes should have fast extrusion rate, good processing characteristics and resistance to deforming during storage and curing. This scheme envisages manufacture of tubings with indigenous raw materials only.

The demand for different types of rubber tubings has been steadily increasing and some of the units producing rubber tubings are working additional shifts to meet the demand. Though specific information on demand of this item are not available, based on the performance of the existing units it is clear that there is good demand for the product.

In the small scale sector during 1970-71, rubber tubings worth Rs. 127 lakhs are reported to have been produced.

II. Technical Aspects**(a) Process outline**

Rubber is compounded in a mixing mill after addition of the various ingredients. The mixed mass is then extruded through a suitable extruder in the form of tube in length 50' to 100' which largely depends upon the diameter of the tube. The extruded tubes are continuously coiled with Talc on a pan stick are then transferred to vertical vulcaniser or autoclave where vulcanisation is done in open steam under pressure of 40 to 50 lbs per square inch.

(b) Quality Specifications : IS: 637 (1965).

(c) Production Capacity : (Per Annum/Shift)

- (i) Quantity 48,000 Kgs.
(ii) Value Rs. 7,68,000/-

III. Financial Aspects**I. Fixed Capital****(i) Land and Buildings :**

Land	1000 sq. Metres	} Rented.
Built area	200 sq. m.	
Office, Stores etc.	50 sq. m.	
Working Shed	150 sq. m.	

Rs. 1,000/- p.m.

(ii) Machinery and Equipment :

Description	Indigenous Imported.	Qty.	Price (Rs.)
(a) Mixing mill, 12" x 30" with chilled rolls with reduction gears 30 HP Motor etc.		1 No.	75,000.00
(b) Extruder 2½"—7.5 HP		1 No.	15,000.00
(c) Vulcaniser—size 4' x 8'		2 Nos.	20,000.00
(d) Boiler (Oil fired) with evaporation cap. 250 kg. per hr. 100 lbs/sq. inc. working pressure		1 No.	25,000.00
(e) Tray tables, weighing machine etc.			5,000.00
Total			1,40,000.00

(iii) Testing Equipment :

(i) Thickness gauge	1 No.	700.00
(ii) Hardness Tester	1 No.	800.00
(iii) Ageing Block	1 No.	7,000.00
		8,500.00

Electrification, Installation charges @ 10% of the cost of machines & equipment	14,850.00
Cost of office equipment/working tables etc.	5,000.00

Total (Machinery & equipment) **1,68,350.00**

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2. Working Capital (Per Month)

S.No.	(i) Personnel	No.	Salary	Total
1	2	3	4	5
				(Rs.)
1.	Supervisor	1	500	500.00
2.	Storekeeper/Clerk	1	400	400.00
3.	Typist	1	400	400.00
4.	Accountant	1	500	500.00
5.	Watchman/Peon	3	150	450.00
6.	Salesman	1	500	500.00

1	2	3	4	5
				Rs.
1. Manager/Chemist.	1	1,000		1,000.00
2. Skilled workers	5	Rs. 15/- per day		1,875.00
3. Semi-skilled	2	Rs. 10/- per day		500.00
4. Unskilled	3	Rs. 5/- per day		375.00
				6,500.00
(+) Perquisites @ 15% of Salaries				975.00
Total (Personnel)				7,475.00

(ii) Raw Materials

Particulars	Qty.	Rate	Value (Rs.)
Natural Rubber	2000 kg.	@Rs.10/-kg.	20,000.00
Clay	700 kg.	0.50/-kg.	350.00
Whiting	1400 kg.	0.50/-kg.	700.00
Precipitated calcium carbonate	1400 kg.	2/- kg.	2,800.00
Aromatic Oil	250 kg.	2/- kg.	500.00
Brown Factice	700 kg.	7/- kg.	4,900.00
Zinc Oxide	125 kg.	@ Rs. 10/-kg.	1,250.00
Stearic acid	25 kg.	12/-kg.	300.00
Anti Oxidant	25 kg.	45/-kg.	1,125.00
Accelerator	50 kg.	40/-kg.	2,000.00
Paraffin wax.	50 kg.	4	200.00
Sulphur	60 kg.	3	180.00
Colour	5 kg.	30	150.00
Titanium Dioxide	50 kg.	15	750.00
Packing Materials (Hessian Bag)	..S.		1,000.00
Total (Raw Material)			36,205.00

(iii) Utilities

Power	5000 KWH Units	1,000.00
Fuel (steam/Furnace Oil)		2,500.00
Water 100 K:		100.00
Total Cost of Utilities		3,600.00

(iv) Contingent Expenses

Rent	1,000.00
Postage & Stationery	500.00
Repairs & Maintenance@5% of M/c.	700.00
Advertisement Publicity @ 1% of total sales	640.00
Minor taxes & insurance 1½%	960.00
Total (Contingent expenses)	3,800.00

(v) Total Recurring Expenditure

	Rs.
Staff & Labour	7,475.00
Raw Materials	36,205.00
Utilities	3,600.00
Contingent expenses	3,800.00
	51,080.00

(vi) Working capital for 3 months 1,53,240.00

3. Total Capital Investment :

(i) Fixed Capital	1,68,350.00
(ii) Working Capital for 3 months	1,53,240.00
Total (Capital Investment)	3,21,590.00

4. Cost of Production (per year)

Total recurring costs per year	6,12,960.00
Depreciation on machinery & Equipment @ 10%	16,830.00
Depreciation on office equipment @ 15%	1,000.00
Interest on total Investment @ 15%	48,210.00
Total	6,79,000.00

5. Turn-over (per year)

Item	Qty.	Rate	Value
			Rs.
Tubing (Rubber)	48000 kg.	Rs. 16/- kg.	7,68,000.00
Total Turn-over			7,68,000.00

6. Profit per year	(5.4)	Rs.	89,000.00
7. Rate of Return			28%
8. Break even Point			60%

Addresses of machinery/Raw Material suppliers.

1. M/s. Mac Nail & Berry Ltd.,
Connaught House, New Delhi
2. M/s. Ganson (P) Ltd.,
G-77, Himalaya House,
Curzon Road, New Delhi.
3. M/s. Universal Engg. Works, Worli,
Bombay.
4. M/s. Sam Sons Engg. Works,
Bangalore.
5. ICI (India) Pvt. Ltd., P. O. Box. 310.
Crescent House, Bellard Estate
Bombay-1.
6. M/s. Bayer (India) Ltd.,
Nagin Mahal, Veery Nariman Road,
Bombay.
7. M/s. Rubber Board, Kottayam, Kerala.
8. Texmaco,
Belghariya, Dist. 24 Paraganas, West Bengal.
9. Kamani Metallic Oxides Pvt. Ltd.,
Nicols Road, Kamani Chamber, Bombay-1.

(Reserved item S. No. 114)

I. Introduction

Manufacture of cycle tyres and tubes is possible well within the investment of small scale industries and a good number of such units are working successfully in different parts of our country. Bicycles continues to be the most popular conveyance for the masses and this is going to be so, for a long time to come. Small Scale cycle tyre and tube units can also function as ancillaries to established large scale cycle manufacturers in India.

II. Technical Aspects**(a) Process Outline :****(a) Cycle Tyres**

Cycle tyres are manufactured by curing with the help of air bags.

The rubber is compounded on a two roll mixing mill and the tread strip is then calendered on a special calender or sometimes conveniently extruded. The extruder can also be used for manufacturing the air bags. The tyre cord fabric is spread with the rubber compound dissolved in solvent oil and then cut to the required width.

The green tyre is built up on tyre building machine (hand operated case former or monoband machine). The spread bias cut fabric is laid over the drum. Soldered bead wires are placed over the fabric to ensure proper placement and union of the bead wire to the fabric. Generally the wire is wrapped with a small strip of calendered square woven fabric, which is folded back to enclose the bead. The entire assembly is next rolled to remove any air bubbles. Recently m/cs. are also available known as 'monoband'. The tread is placed over monoband and rolled well to secure good adhesion. Then the building drum is collapsed and the built-up green tyre removed. Into the green tyre, an air bag is inserted and the green tyre after shaping is cured in Multi Daylight Tyre Presses. The moulding pressure is obtained with the help of air pressure in the air

bag. After curing, the press can be opened, the cured tyre can be removed with the air bag and then the tyre separated.

(b) Cycle Tubes

Cycle tubes can be manufactured either by moulding method or by the mandrel curing method. For both the process, first of all, the rubber is compounded in a two roll mixing mill and extruded in the form of tubes, about 2.25 metres long. In the moulding process, the valve tube is fitted to the green tubes. The tube is then cut to a definite length, joined by means of a butt joining machine and vulcanised in a watch case type heated mould having air pressure inside. In the mandrel curing method, the green tubes are mounted on mandrels and cured in open steam. The vulcanised tubes are cut to definite length and the valve tubes are fixed to these tubes after vulcanisation. The two ends of the tube are then joined together by means of a cold curing rubber solution followed by vulcanisation in small electric press. Generally manufacture by mandrel curing method is adopted by the small scale industries. Recently indigenous machines have been developed to manufacture seamless tubes which have got good export markets. But the present scheme has not included those machines as the process is still in the development stage.

**(b) Quality Specifications: IS: (Cycle Tyres)
IS: (Cycle Tubes)**

(c) Value	Rs.
	4,37,000/-

III. Financial Aspects

(i) Fixed Capital:	Rs.
Land—1000 Sq. metres.	250
Built area,	
Office Stores, } 700 sq. metres.	2,800
Working Shed. }	3,050

(ii) Machinery & Equipment:

(a) Tyre Section	Qty.	Price (Rs.)
1. Rubber Mixing Mill size 14" x 36" 1 No. complete with drive arrangements, reduction gear, safety devices & accessories. 40 HP motor 1440/440/3150 cycles		1,00,000

*This Project profile is equally suited for manufacture of Rickshaw Tyres & Tubes. However for rickshaw tyres 4-ply frictioned fabric is needed and requirement of raw materials would need to be suitably modified.

		Rs.
2. 2 Bowl vertical tread roller of size 6"×14" complete with drive arrangements and accessories of 5 HP motor.	1 No.	20,000
3. Cycle tyre vulcanising press (4 daylight) complete with 4 sets of moulds duly engraved hydraulic pump with control & accessories.	4Nos.	1,84,000
4. Air Bag Vulcanising Press complete with mould.	1 No.	20,000
5. Rubber spreading m/c. 60"width, 18' long braided type complete with electrical & mechanical drives, steam chest, rubberised rolls of 8" dia & all other accessories.	1 No.	40,000
6. Rubber solution mixer complete with electrical, mechanical drives, 5 HP Motor.	2 Nos.	10,000
7. Monoband tyre building machine complete with electricals & accessories.	1 No.	25,000
8. Hand operated case former.	6 Nos.	6,000
(b) Tube Section		
1. Rubber mixer mill of size 12"×30" complete with all accessories (chilled controls) 40 HP Motor Reduction Gear.	1No.s	75,000
2. Vulcaniser of size 5'×10'L complete with trolley arrangements hinged door & all other accessories.	1 No.	30,000
3. Valve nut Tightening Machine complete with 1 HP motor all other accessories.	1 No.	2,000
4. Valve nut Punching Machine (Double action) insertion as well as punching) pedal type complete with accessories.	1 No.	3,000
5. Air removing machine complete with all accessories.	1 No.	8,000
6. Mandrel made out of Aluminium.	200 Nos @Rs.40/-	8,000
Common for tyre & tube Section		
1. Air Compressor of Model IST 2050 lbs cap. with 15HP. Elec. Pump. 50 cfm.	1 No.	14,800
2. Rubber extruder of size 4" complete with electrical, mechanical drives conveyors & all accessories with 10 HP motor.	1 No.	20,000
3. Vertical cross Tube Boiler 150 PSI cap. 1500 kg/hr.	1 No.	75,000
4. Small printing machine.	1 No.	500
5. Fire Extinguishers.	5Nos.	2,500
6. Weighing balance & Misc tools		2,500
		6,46,300
Testing Equipments		
i. Thickness Gauge		700
ii. Hardness Tester.		800
iii. Tensile testing machine		18,000
iv. Compression Testing Apparatus		2,500
v. Impact tester		4,000
vi. Abrador		3,000
vii. Ross Flex Machine.		3,000
viii. Ageing Beck		7,000
		Rs. 39,000

Electrification & Installation charges @10% of cost of machines & equipment	Rs. 68,500
Cost of moulds/other fixtures	—
Cost of Office Equipment/Working etc.	5,000
Transformer & Accessories	25,000
Total (Cost of Machinery & Equipment)	7,83,800

2. Working Capital

(i) Personnel:				Rs.
Salesmen	2	500		1000
Storekeeper	1	400		400
Clerk/Typist	1	400		400
Cashier/Accountant	1	400		400
Watchman	3	150/each		450
Chief Chemist/ Manager	1	1000		1000
Asstt. Chemist	1	500		500
Supervisor	2	500		1000
Skilled worker	10	@15/day		3750
Semi-skilled	10	@10/-day		2500
Unskilled	5	@5/-day		625

12025

(+) Perquisites@15%of salaries.

1800

Total (Personnel)

13825

(ii) Raw Materials		Qty	Rate	Value
(a) Synthethic Rubber				Rs.
(SBR)		4500Kg. @	Rs.8/- Kg.	37,000
(b) Smoked sheet (Not Rubber)		4500kg. @	Rs.10/-	45,000
(c) Reclaimed Rubber		3000kg. @	Rs.3/-	9,000
(d) Stearic Acid		160kg. @	Rs.12/-	1,920
(e) Zinc Oxide		320kg. @	Rs.14/-	4,480
(f) Carbon Black		1100kg. @	Rs.8/-	8,800
(g) Chinaclay		10000kg. @	Rs.0.50/-	5,000
(h) Antioxident (NONOX)		180 Kg @	Rs.45/-	8,100
(i) Accelerator (PBN, HFN DPG, TMTD, MBT)		160kg. @	Rs.40/-	6,400
(j) Pine Oil		50kg. @	Rs.2/-	100
(k) Paraffin		15kg. @	Rs.4/-	60
(l) Process Oil		50kg. @	Rs.2/-	100
(m) Sulphur		200kg. @	Rs.3/-	600
(n) Fabrics-62" wide tyre cord, cotton.		6000 @ meters	Rs.3/-	18,000
(o) Printing ink-LS				500
(p) Copper plated M.S. Bead wire		18750 @ pairs	Rs.0.50/-	9,370
(q) Valve fillings		18750 @ Nos.	Rs.0.40/-	7,500
(r) Solvent Oil		1500 @ lts.	Rs.3.50/-	5,200
(s) Packing Materials				1,000

Total (Raw Materials) Rs.

157,130

(iii) Utilities

	Rs.
Power 14250 KWH units	3450
Fuel (Steam/Furnace Oil)	5000
Water 100 Kilolitres	100
Total (Cost of Utilities)	8550

(iv) Contingent Expenses

	Rs.
Rent	3050
Postage & Stationery	500
Telephone	..
Consumable Stores.	..
Repairs & Maintenance @ 5% of M/c	3000
Transport charges	..
Advertisement Publicity @ 1 % of Sales	2800
Minor taxes insurance etc. 1.5% of Sales.	4200
Total (Contingent Expenses)	13,550

(v) Total Recurring Expenditure

	Rs.
(i) Staff & Labour	13,825
(ii) Raw Material	1,52,130
(iii) Utilities	8,550
(iv) Contingent expenses	13,550
(v) Total Working Capital (for 3 months)	5,79,165

3. Total Capital Investment

	Rs.
(i) Fixed Capital	7,83,800
(ii) Working Capital for 3 months	5,79,165
	13,62,965

4. Cost of Production (Per Year)

	Rs.
Total recurring costs per year	23,16,660
Depreciation on machinery & Equipment @10%	78,380
Depreciation on Furnaces @ 30%	..
Depreciation on moulds & fixtures etc. @25%	..
Depreciation on Office equipment @ 20%	1,000
Interest on Total Investment @ 15%	2,04,435
Total Cost of Production	26,00,475

5. Turn-over Per Year

Item	Qty.	Rate	Value Rs.
Tyres & Tubes Cycles Tyre-225000 Nos. @ Rs. 9½/			21,37,500
Tubes 225000Nos @ 4/-			9,00,000
Total Turn-Over			30,37,500

	Rs.
6. Profit per year	4,37,025
7. Rate of Return	32%
8. Break-even-Point	51%

9. Name and Addresses of Suppliers of Machinery/Equipment and Raw Materials

(a) Machinery

1. M/s. Indian Expeller Works, A., Naroda Industrial Estate, Naroda, Ahmedabad-2.
2. M/s. Sonal Engineering Works. Off. Haines Road, Bombay-13.
3. M/s. Richardson & Cruddas Ltd. Byculla, Bombay-8.
4. M/s. Bravo & Co. 108, Patwarbagan Lane, Calcutta-19.

(b) Rubber Chemicals

1. M/s. ICI India Pte. Ltd. P.O. Box. No. 310. Crescent House, Ballard Estate, Bombay-1.
2. M/s. Bear India Ltd. Nagin Mahal, Vir Nariman. Road, Bombay-1.
3. M/s. Monsanto Chemicals (India) Pte. Ltd. Wakefield House Sprott Road, Bombay.

(c) Reclaimed Rubber

M/s. Indian Rubber Regenerating Co. 32, Nicols Road, Bombay-1.

(d) Carbon Black

1. M/s. United Carbon (India) Ltd. 133, Mahatma Gandhi Road, Bombay-1.
2. M/s. Philips Carbon Black Ltd. Udyog Bhavan, Ballard Estate, Bombay-1.

(e) Process Oils and Solutions

M/s. Esso Standard Inc. P.O. 181, Bombay-20.

(f) Zinc Oxide

1. M/s. Kamanic Metallic Oxides Pt. Ltd. Nicols Road, Kamani Chambers, Bombay-1.

(g) Mineral Fillers

1. M/s. Kilachand Devachand Co. Pte. Ltd. Rubber Division, 7, Jamshedji Tata Road, Bombay-20.

(h) Synthetic Rubber

1. M/s. Kilachand Devachand Co. Pte. Ltd. Rubber Division, 7, Jamshedji Tata Road, Bombay-20.

(i) Stearic Acid

M/s. Godrej Soaps Pte. Ltd. 3/6, Delisle Road, Bombay-11.

(Reserved item Sl. No. 104 & 105)

HOSIERY INDUSTRIES

COTTON SOCKS KNITTED

I. Product & Its Uses

All over the Country, persons wear socks with their shoes. The cotton socks are the only socks which are cheaper than the other type of socks like nylon and woollen socks. Due to their characteristics Cotton socks can be used in all the seasons whereas in summer season it is not possible to use woollen socks and to some extent nylon socks also. This type of Industry can be set up under small scale sector in towns and villages. Moreover machinery and raw materials required to start this industry are indigenously available.

II. Production Targets (Per Annum)

(a) QUANTITY (Dozens)	6000
(b) VALUE (Rs)	180000

III. Process of Manufacture

Grey cotton yarn purchased from the spinning mills or yarn dealers is sent to dyers for dyeing as per required shades or for bleaching. This dyed or bleached yarn is wound on to the wooden bobbins or paper cones. These bobbins or paper cones are placed on the socks knitting machines and socks are knitted as per required design and sizes. The toe portion of the socks is linked by hand. These socks are pressed, packed and are ready for marketing. These socks can be embroidered also by ladies.

IV. Quality Control Standards

ISI has prepared standard specifications for cotton socks knitted, want for defence, (IS: 3329-1973) but for civilians' consumption, so far there is no standard available. However, the best way to keep a quality control over the products manufactured attention may be given to the purchase of correct count of cotton yarn and colours shall be fast to rubbing, washing and perspiration. Number of courses and wales per C.M. may also be checked time to time.

V. Land and Building

(a) Covered area	70 Sq. Mts.
(b) Uncovered area	30 sq. Mts.
(c) Total area	100 Sq. Mts.
(d) Rental value (Per Month)	Rs. 500.00

VI. Machinery and Equipment

S. No.	Description	Imported/ Indigenous	Qty	Value(Rs)
1.	Hand driven socks knitting machines 3 3/4" dia. 144 needles	Indigenous	5	45.00
2.	Hand operated socks knitting machines 3 1/2" dia. 132 needles	"	3	24.00
3.	Hand operated socks knitting machines 3" dia. 96 needles	"	2	1200.00
4.	Hand wheels (winding)	"	2	200.00
5.	Equipments, Pressing lables, firmas, balance, office furniture etc.	"	—	1700.00
Total				10000.00

VII. Raw Materials (Per Month)

S.No.	Particulars	Imported/ Indi- genous	Qty kg.	Rate Rs.	Value Rs.
1.	Cotton yarn dyed & bleached 2/20, 2/16, 10 single, 20 single counts.	Indi- genous	300	20/-	6000.00
2.	Elastic thread, lables, wrappers, card board, boxes etc.	"	—	—	1600.00
Total					7600.00

VIII. Staff and Labour (Per Month)

				Rs.
(a) Administrative & Supervisory				
(i)	Manager	1	500	500.00
(ii)	Peon/Chowkidar	1	200	200.00
(b) Technical (skilled Unskilled)				
(i)	Machine operator	10	250	2500.00
(ii)	Winding (ladies)	2	100	200.00
(iii)	Linking (ladies)	4	75	300.00
(iv)	Pressman	2	250	500.00
(v)	Packer/Misc. work	1	200	200.00
				4400.00
Plus perquisites @ 15% of salaries				660.00
Total				5060.00

IX. Other Expenses (Per Month)		Rs.
(1) Rent of Building		500.00
(2) Electric charges		50.00
(3) Advertisement & Travelling		50.00
(4) Transport		50.00
(5) Consumable stores, needles, oil etc.		100.00
(6) Postage expenses/Telephone		50.00
(7) Stationery		50.00
(8) Repair & Maintenance		90.00
Total		940.00

X. Working Capital (For 3 Months)		Rs.
(a) Raw Materials	$7400 \times 3 =$	22800.00
(b) Salaries & wages	$5060 \times 3 =$	15180.00
(c) other expenses	$940 \times 3 =$	2820.00
Total		40800.00

XI. Total Capital Investment		Rs.
(a) Machinery & Equipment		10000.00
(b) Working capital for 3 months		40800.00
Total		50800.00

XII. Cost of Production (Per Annum)		Rs.
(a) Total recurring cost per year		163200.00
(b) Depreciation on machinery & equipment @ 10%		1000.00
(c) Interest on total investment @ 12%		6096.00
Total		170296.00

XIII. Sales Proceeds (Per Annum)

S. No.	Item	Qty Dozen	Rate Rs./Doz.	Value (Rs.)
1.	Cotton socks knitted	6000	30/-	180000.00

XIV. Profitability (Before Income tax)(—) 170296.00

(a) Annual Profit = 9704

(b) %age of profit on sales

$$\frac{\text{Annual Net Profit} \times 100}{\text{Annual sales}} = \frac{9704 \times 100}{180000} = 5.4\% \text{ (App.)}$$

(c) %age of profit on Investment.

$$\frac{\text{Annual Net Profit} \times 100}{\text{Investment}} = \frac{9704 \times 100}{50800} = 19\%$$

XV. Break Even Analysis

(%age of total production envisaged.)

$$\frac{\text{Annual fixed cost} \times 100}{\text{Annual sales} - \text{Annual variables costs.}} = 87\%$$

XVI. I. Manufacturers Suppliers of Machinery

- M/s. Excelcior Mechanical Works,
6, Harphool Singh Bldg. Sabzi Mandi, Delhi-7.
- M/s. Kalsi Engineering Works,
Neemwala Chowk, Ludhiana.
- M/s. Om Mechanical Works,
Shahpur Road, Sobhani Bldg.,
Ludhiana.
- M/s. New India Machinery Works,
Chawal Bazar, Ludhiana.

II. Suppliers of Raw Materials

- M/s. Vardhman Spinning & General mills Ltd.,
Samrala Road, Ludhiana.
- M/s. Suraj Hosiery mills,
Dal Bazar, Ludhiana.
- M/s. Agarwal yarn agencies,
38, Kashi Mittsi Ghat Street,
Bagh Bazar, Calcutta-700003.
- M/s. Janki Ram Mills Ltd.,
Rajapalayam (TN).

(Reserved item Sl. No. 19)

COTTON UNDER-GARMENTS KNITTED

I. Products and Its Uses

Cotton under-garments include underwears like Cotton Drawers, under Pants and Nickers, which are used and liked by people, because of their stretchibility, softness and comfortable to wear. The prices of cotton under-wears and Nickers are very low and are within the reach of common masses. In this scheme guidelines for the manufacturing of gent's cotton under-wears and children's cotton nickers are given. Manufacture of these items is very simple and easily manageable with a little knowledge of cutting and stitching machines and raw materials required to start this industry are indigenously available. There is a good scope for this industry to be started in the rural areas of the country.

II. Production Targets (Per Annum)

	Cotton underwears	Cotton nickers
(a) Quantity (Dozens)	6000	7500
(b) Value (Rs.)	240000	150000

III. Process of Manufacture

Cotton knitted cloth purchased from the knitting units is spread on the cutting table and required sizes of under-wears and nickers are cut by hand scissors. These cut pieces are overlocked and tapes are attached with folding machines. These stitched garments are pressed and packed for marketing.

IV. Quality Control Standards

So far no proper standards are available for the manufacture of these items. However, attention must be given to purchase of good quality of cotton knitted cloth, with even stuff and fast colours.

V. Land and Building

(a) Covered area (Three rooms)	70 Sq. Mts.
(b) Uncovered area	30 Sq. Mts.
(c) Total area	100 Sq. Mts.
(d) Rental Value (Per Month)	Rs. 500.00

VI. Machinery and Equipment

S. No.	Description	Imported/ Indigenous	Qty	Value (Rs)
1.	Overlock machine three threads with motor	Indigenous	2	3000.00
2.	Folder machine	"	1	3000.00
3.	Rib cutting machine	"	1	500.00
4.	Pressing tables, cutting tables, tables & stools, Electric iron office, furniture, scissors etc.	"	lot	1500.00
Total				8000.00

VII. Raw Materials (Per Month)

S. No.	Particulars	Imported/ Indigenous	Qty Kg.	Rate Rs/kg.	Value (Rs)
1.	Fine cotton knitted cloth (Interlock) of 40 single quality	Indigenous	400	40/-	16000.00
2.	Cotton knitted cloth (Interlock) of 20 single quality	"	250	20/-	5000.00
3.	Elastic tapes, Packing Boxes for individual pieces, sewing threads, stips, Cartoons etc.	"	lot	—	4700.00
Total					25700.00

VIII. Staff and Labour (Per Month)

(a) Administrative & Supervisory			
(1) Manager	1	500	500.00
(2) Peon/Chowkidar	1	200	200.00
(b) Technical (Skilled-Unskilled)			
(i) Machine operator	3	300	900.00
(ii) Cutter master	1	400	400.00
(iii) Pressman/Rib cutter	2	250	500.00
(iv) Packer/Misc. work	1	200	200.00
			2700.00
Plus Perquisite @ 15% of salaries			405.00
Total			3105.00

IX. Other Expenses (per Month)

	Rs.
(i) Rent of Building	500.00
(ii) Electricity charges	70.00
(iii) Advertisement & Travelling	50.00
(iv) Consumable stores, oils, needles etc.	75.00
(v) Transport	50.00
(vi) Postage expenses/Telephones	50.00
(vii) Stationery	50.00
(viii) Repairs and Maintenance	50.00
Total	895.00

X. Working Capital (For 3 months)

(a) Raw Materials	25700 × 3 =	77100.00
(b) Salaries and wages	3105 × 3 =	9315.00
(c) other expenses	895 × 3 =	2685.00
Total		89100.00

XI. Total Capital Investment

(a) Machinery & Equipment	8000.00
(b) Working capital for 3 Months	89100.00
Total	97100.00

XII. Cost of Production (Per Annum)

(a) Total recurring cost per year	356400.00
(b) Depreciation on machinery & equipment @10%	800.00
(c) Interest on total investment @12%	11652.00
Total	368852.00

XIII. Sales Proceeds (Per Annum)

S. No.	Item	Qty Dozens	Rate Rs/Doz.	Value (Rs)
1.	Cotton underwears	6000	40/-	240000.00
2.	Cotton nickers	7500	20/-	150000.00
	Total			390000.00

XIV. Profitability Before Income Tax (—)

(a) Annual Profit = 21148

(b) %age of profit on sales

$$\frac{\text{Annual Net profit} \times 100}{\text{Annual sales}} = \frac{21148 \times 100}{390000} = 5.4\%$$

(c) %age of profit on investment.

$$\frac{\text{Annual Net profit} \times 100}{\text{Investment}} = \frac{21148 \times 100}{97100} = 22\%(\text{App.})$$

XV. Break Even Analysis

(%age of Total Production envisaged)

$$\frac{\text{Annual fixed cost} \times 100}{\text{Annual sales} - \text{Annual variable costs}} = 71\%$$

XVI. Manufacturers/Suppliers of Machinery

1. M/s. Akal Mechanical Works,
Purana Bazar Ludhiana.
2. M/s. Swarup Mechanical Works,
Industrial area 'B' Ludhiana.
3. M/s. Jain Overlock Machine Syndicate,
Chawal Bazar, Ludhiana.
4. M/s. Raj Nirmal Engineering Works,
Industrial Area 'A', Ludhiana.

II. Suppliers of Raw Materials

1. M/s. Jugmani Hosiery mills,
Madhupuri-I, Ludhiana.
2. M/s. Jaipur Hosiery Mills,
Adarsh Nagar, Jaipur.
3. M/s. Agarwal Yarn Agencies,
38, Kashi Mittri Ghat Street,
Bagh Bazar, Calcutta-700003.
4. M/s. Oyes Textiles,
83, Mangalam Road, Tirupur-638604.
5. M/s. Spica Plastics,
99, Vithalwadi, Bombay-2
(Elastic straps).

(Reserved item Sl. No. 20)

COTTON VESTS KNITTED**I. Product and Its Uses**

Cotton Vests (knitted) or cotton Baniyans is an item of essential, requirement and utility, as they are very comfortable to wear being soft in feel and good absorbent of sweat. Manufacture of cotton vests involve very simple operation and is easily manageable with the available knowledge of cutting and tailoring. Machinery and cloth required to start this industry are available indigenously.

II. Production Targets (Per Annum)

(a) Quantity (dozens)	30000
(b) Value (Rs)	1380000

III. Process of Manufacture

Bleached Cotton knitted fabric of 20 single quality purchased from the knitting units is spread on the cutting table and with the help of hand scissors, requisite sizes of vests are cut. These cut pieces are joined by stitching process with the help of overlock and chainlock stitching machine. Thereafter these are pressed and packed in cardboard boxes and are ready for despatch.

IV. Quality Control Standards

Product standards IS: 4964 (Part-II) 1975 and IS: 4965 (Part-B) 1975 may be followed. To keep quality control of the products attention must be given to purchase even stuff and of required count yarn.

V. Land & Building :

(a) Covered area (3 Rooms)	70 Sq. Mtrs.
(b) Uncovered area	30 Sq. Mtrs.
(c) Total area	100 Sq. Mtrs.
(d) Rental value (Per month)	Rs. 500.00

VI. Machinery and Equipments

S. No.	Description	Imported/ Indi- genous	Qty	Value (Rs)
1	2	3	4	5
1.	Overlock stitching machine without motor	Indigenous	4	4000.00
2.	Chainlock stitching machine without motor	"	3	1500.00

1	2	3	4	5
3.	Flat lock stitching machine without motor	"	1	5000.00
4.	Hand Press machine (Dhan machine)	"	1	1500.00
5.	Electric motor 2 PH & fitting.	"	1	1500.00
6.	Electric Presses (irons)	"	2	500.00
7.	Pressing tables, cutting tables, scissors, stools, office furniture etc.		lot	2000.00
Total				16000.00

VII. Raw Material (Per Month)

S. No.	Particulars	Imported/ Indi- genous	Qty Kg.	Rate Rs/Kg.	Value (Rs)
1.	Bleached cotton knitted fabric (20 single yarn quality)	Indigenous	3850	24/-	92400.00
2.	Sewing thread and lables	"	—	—	2200.00
3.	Card Board boxes & Polythene bags	"	5000 Boxes	Bag	2800
4.	Wooden Boxes & Packing material	"	—	—	1100.00
Total					98500.00

VIII. Staff and Labour (Per Month)

(a) Administrative & Supervisory						
(1) Manager	.	.	.	1	500	500.00
(2) Sales man	.	.	.	1	350	350.00
(3) Clerk/Typist	.	.	.	1	250	250.00
(4) Peon/Chowkidar	.	.	.	1	200	200.00
(b) Technical (Skilled Unskilled)						
(1) Cutter Masters	.	.	.	2	350	700.00
(2) Stitching machine operators	.	.	.	8	300	2400.00
(3) Pressmen	.	.	.	2	300	600.00
(4) Packagers	.	.	.	2	200	400.00
						5400.00
Plus Purquisites @15% of salaries						810.00
Total						6210.00

IX. Other Expenses (Per Month)		Rs.
(1) Rent of Building		500.00
(2) Electricity charges		150.00
(3) Advertisement & Travelling		250.00
(4) Transport		60.00
(5) Consumable stores needles, oils etc.		60.00
(6) Postage expenses/Telephones		100.00
(7) Stationery		100.00
(8) Repairs & Maintenance		70.00
Total		1290.00

X. Working Capital (For 3 Months)		
(a) Raw materials	$98500 \times 3 =$	295500.00
(b) Salaries & wages	$6210 \times 3 =$	18630.00
(c) Other expenses	$1290 \times 3 =$	3870.00
Total		318000.00

XI. Total Capital Investment	
(1) Machinery & Equipment	16000.00
(2) Working capital for 3 months	318000.00

XII. Cost of Production (Per Annum)	
(a) Total recurring cost per year =	1272000.00
(b) Depreciation on machinery equipment @ 10%	1600.00
(c) Interest on total investment @ 12%	40080.00
Total	1313680.00

XIII. Sales Proceeds (Per Annum)

S. No.	Item	Qty Dozen	Rate Rs/Doz.	Value (Rs)
1.	Cotton Vests knitted	30000	46/-	1380000.00

XIV. Profitability (Before income tax) (—)	1313680.00
(a) Annual Profit =	66320.00

(b) %age of profit on sale	
Net profit per year $\times 100$	$\frac{66320 \times 100}{1380000} = 5\% \text{ (App.)}$
Sales	1380000
(c) %age of profit on investment.	
Net Profit per year $\times 100$	$\frac{66320 \times 100}{334000} = 20\% \text{ (App.)}$
Investment	334000

XV. Break Even Analysis

(%of total production envisaged)	
B.E.P. Annual fixed cost $\times 100$	$\frac{\text{Annual sales} - \text{Annual Variable cost}}{\text{Annual sales}} = 60\%$
Annual sales—Annual Variable cost	

XVI. Manufacturers Suppliers of Sticking Machines

1. M/s. Akal Mechanical Works, Purana Bazar, Ludhiana.
2. M/s. Swarup Mechanical Works, Industrial area B Ludhiana.
3. M/s. Raj Nirmal Engineering works, Industrial Area A Ludhiana.
4. M/s. Jain overlock machines syndicate, Chawal Bazar, Ludhiana.

II. Suppliers of bleached knitted Cloth (Raw Material)

1. M/s. Jugmani Hosiery Mills, Madhupuri Ludhiana.
2. M/s. Calcutta Hosiery Mills, Sansar Chander Road, Jaipur.
3. M/s. K.A.K. Knitting Company, Kuppana Chettiar Street, Tirupur.
4. M/s. OKEY Textiles, 94 (B) 1, Laxminagar, Main Road, Tirupur.

(Reserved item Sl. No. 18)

OTHER COTTON KNITTED WEARS

I. Product and Its Uses

I. For people living in the rural areas of under developed regions of the country, Cotton knitted outerwears such as gents coats, Pullovers, slipovers and children suits etc. are as a substitutes for woollen garments, which are beyond their limitations to purchase because of high prices. Manufacturing of these items is very simple and manageable with a little knowledge of cutting and stitching. Investment on machinery is very less. Machines and raw materials required to start this industry are indigenously available. There is a good scope to start such type of Industry in rural areas of the country.

II. Production Targets (Per Annum)

	Gents Coats	Gents pullovers	Gents Slipovers	Children suits.
(a) Quantity (Dozens)	1200	1200	1200	1200
(b) Value (Rs.)	201600	144000	108000	86400

III. Process of Manufacture

Cotton knitted cloth in different designs and colour combinations is purchased from the knitting units. This cloth is spread on the cutting table and required size, of garments are cut. These cut pieces are first stitched with lock stitch sewing machines then are overlocked. The stitched garments are pressed and packed for marketing.

IV. Quality Control Standards

So far no proper standards are available for the manufacturing of these items. However, attention must be given to purchase cotton knitted cloth of good quality and fast colours.

V. Land & Building

	Sq. Mtrs
(a) Covered area (3 Rooms)	70
(b) Uncovered area	30
(c) Total Area	100
(d) Rental value (Per Month)	Rs. 500/-

VI. Machinery & Equipments

S. No.	Description	Imported/ Indigenous	Qty.	Value (Rs.)
1.	Overlock Stitching machines three threads with motors	Indigenous	2	3000
2.	Sewing machines with Motors.	"	4	3000
3.	Cutting tables, Electric iron, Pressing table, Balance, tables & stools, office furnitures etc.	"	lot	1500
Total				7500

VII. Raw Materials (Per Month)

S. No.	Particulars	Imported/ Indigenous	Qty Kg.	Rate Rs	Value Rs.
1.	Designed Knitted cloth	Indigenous	1260	28	35280
2.	Tables, Sewing thread Buttons, polythelene Bags, strips				
	Wooden Boxes	"			1220
Total					36500

VIII. Staff & Labour (Per Month)

(a) Administrative & Supervisory				
(1) Manager	1	500	500	
(2) Peon/Chowkidar	1	200	200	
(b) Technical (Skilled-Unskilled)				
(1) Machine Operators	6	250	1500	
(2) Cutter Master	1	400	400	
(3) Pressman	2	250	500	
(4) Packer/Misc. Work	1	200	200	
				3300
Plus pur requisites @ 15% of salaries				495
Total				3795

IX. Other Expenses (Per Month)

	Rs.
(i) Rent of Building	500
(ii) Electricity charges	55
(iii) Advertisement & Travelling	40
(iv) Consumable stores, oils, needles etc.	40
(v) Transport	40
(vi) Postage Expenses/Telephones	40
(vii) Stationery	40
viii) Repairs and Maintenance	50
Total	805

X. Working Capital (For 3 Months)

(a) Raw materials	36300 × 3 = 109500
(b) Salaries & wages	3795 × 3 = 11385
(c) Other expenses	805 × 3 = 2415
Total	123300

XI. Total Capital Investment

(a) Machinery & Equipment	7500
(b) Working capital for 3 Months	123300
Total	130800

XII. Cost of Production (Per Annum)

(a) Total recurring cost per year	493200
(b) Depreciation on Machinery & Equipment @ 10%	750
(c) Interest on total investment @ 12%	15696
Total	509646

XIII. Sales Proceeds (Per Annum)

S. No.	Items	Qty. (Dozen)	Rate Rs. /Doz.	Value Rs.
1.	Cotton gents coats	1200	168	201600
2.	Cotton Pullovers	1200	120	144000
3.	Cotton Slipovers	1200	84	108000
4.	Children suits	1200	72	86400
	Total.			540000

XIV. Profitability (Before income tax) (—) 509646

(a) Annual Profit = 30354

(b) %age of profit on sales

$$\frac{\text{Annual Net Profit} \times 100}{\text{Annual sales}} = \frac{30354 \times 100}{540000} = 5.6\%$$

(c) %age of profit on investment

$$\frac{\text{Annual Net profit} \times 100}{\text{Investment}} = \frac{30354 \times 100}{130800} = 23.2\%$$

XV. Break Even Analysis

$$\frac{(\% \text{age of total production envisaged}) \text{ Annual fixed cost} \times 100}{\text{Annual Sales} - \text{Annual variable cost}} = 63\%$$

XVI. Manufacturers/Suppliers of Machinery

- (i) M/s. Lkal Mechanical Works, Purana Bazar, Ludhiana.
- (ii) M/s. Swarup Mechanical Works, Industrial Area, B, Ludhiana.
- (iii) M/s. Jain Overlock Machine Syndicate Chawal Bazar, Ludhiana.
- (iv) M/s. Raj-Nirmal Engineering Works, Industrial area, A, Ludhiana.

XVII. Suppliers of Raw Materials.

- (i) M/s. Jugmani Hosiery Mills, Madhupuri, Ludhiana.
- (ii) M/s. Rackman Hosiery Works, Hospital Road, Ludhiana.
- (iii) M/s. Saluja Hosiery Works, Hazoori Road, Ludhiana.
- (iv) M/s. Sangam Knitting Works, Chawal Bazar, Ludhiana.

(Reserved item Sl. No. 22.)

WOOLLEN CAPS KNITTED

I. Product and Its Uses

Beret caps are manufactured from shoddy type of woollen yarn. It is required for Defence, Police, and other Govt. Departments. The Berets are quite easy to manufacture and there is no problem of raw material availability and also machines required to manufacture Beret caps are not costly and are indigenously available.

II. Production Target (per Annum)

(a) Quantity (Dozens.)	7200
(b) Value (Rs.)	50400

III. Process of Manufacture

Shoddy woollen yarn is wound on to the wooden bobbins and these bobbins are placed on the circular knitting machines. The yarn is converted into knitted caps by process of knitting knitted caps are milled, dyed, stitched and pressed for ready despatch.

IV. Quality Control Standards

Woollen caps knitted (Berets) are generally purchased by D.G.S.&D. for Defence or Police and as such these are purchased accordingly to the specifications standards mentioned in the contract. However IS: 5085-1969 for woollen Berets may be followed for guidance to keep the proper quality control on the products.

V. Land Building

	sq. Mts.
(a) Covered area	70
(b) Uncovered area	30
(c) Total area	100
(d) Rented value (per month)	Rs. 500/-

VI. Machinery & Equipment

S. No.	Description	Imported Indigenous	Qty	Value (Rs.)
1.	Hand operated round knitting machines dia 6-1/2"	Indigenous	8	8000
2.	Wooden tube (containers)	"	4	2000
3.	Electric press, Tables, stools, office furniture, sewing machines (4) etc.	"	—	5000
Total				15000

VII. Raw Materials (per Month)

S. No.	Particulars	Imported Indigenous	Qty Kg.	Rate Rs.	Value Rs.
1.	Shoddy Woollen yarn 2/22 count	Indigenous	450	60	27000
2.	Cotton yarn, sewing threads, Polythene sheets, satin cloth eyelets, chemicals.	"	—	—	4000
Total					31000

VIII. Staff and Labour (per Month)

	Nos.	Salary P. Month.	Total
(a) Administrative & Supervisory		Rs.	Rs.
(i) Manager	1	500	500
(ii) Clerk/Typist	1	300	300
(iii) Peon/Chowkidar	1	200	200
(b) Technical (Skilled—Unskilled)			
(i) Knitting machine operators	8	250	2000
(ii) Milling persons	2	250	500
(iii) Stitching persons	4	250	1000
(iv) Press men	2	300	600
(v) Winding of yarn (ladies)	2	100	200
(vi) Packer/Misc. Work	1	200	200
			5500

Plus perquisites @ 15% of salaries.	825
Total	6325

IX. Other Expenses (per month)

	Rs.
(i) Rent of Building	500
(ii) Electricity charges	75
(iii) Advertisement & Travelling	75
(iv) Transport	50
(v) Consumable stores, needles, oils, etc.	100
(vi) Postage expenses/Telephones	100
(vii) Stationery	75
(viii) Repairs & Maintenance	100
Total	1970

X. Working Capital (For 3 months)

(a) Raw Materials	31000 × 3 = 93000
(b) salaries & wages	6325 × 3 = 18975
(c) other expenses	1075 × 3 = 3225
Total	115200

XI. Total Capital Investment

(1) Machinery and equipment	15000
(2) Working capital for 3 months	115200
Total	130200

XII. Cost of Production (per annum)

(a) Total recurring cost per year	460800
(b) Depreciation on machinery & Equipment @ 10%	1500
(c) Interest on Total investment @ 12%	15624
Total	477924

XIII. Sales Proceeds (per annum)

S. No.	Items	Qty (Dozen)	Rate Rs (Dozens)	Value (Rs.)
1.	Woollen Beret caps knitted	7200	70	504000

XIV. Profitability (Before Income tax (—) 477924)

(a) Annual Profit = 26076	
(b) %age of Profit on sales.	
$\frac{\text{Annual Net Profit} \times 100}{\text{Annual sales}} = \frac{26076 \times 100}{504000}$	= 5%

(c) %age of Profit on Investment.

$$\frac{\text{Net Profit} \times 100}{\text{Investment}} = \frac{26076 \times 100}{130200} = 20\%$$

XV. Break-Even Analysis

(% of total production envisaged)

$$\frac{\text{Annual Fixed cost} \times 100}{\text{Annual sales} - \text{Annual variable costs}} = 74\%$$

XVI. I. Manufacturers Suppliers of Machinery.

- (1) M/s. Popular Mechanical & Electrical Works, Chawal Bazar, Ludhiana.
- (2) M/s. Om Mechanical Works, Shahpur Road, Sabhani Bldg, Ludhiana.
- (3) M/s. Kalsi Engineering Works, Neemwala Chowk, Ludhiana.
- (4) M/s. Excelcior Mechanical Works, 6, Harphool Singh Bldg., Sabzi Mandi, Delhi-110007

II. Suppliers of Raw Materials

- (1) M/s. Swadeshi Wool Syndicate, Civil Lines, Ludhiana.
- (2) M/s. Suraj Hosiery Mills, Dal Bazar, Ludhiana.
- (3) M/s. Reliance Trading Corporation, 303, Industrial Area 'A' Ludhiana.
- (4) M/s. Pearl Spinning Mills, Industrial Area 'A' Ludhiana.

(Reserved item Sl. No. 28.)

WOOLLEN CLOTH KNITTED**I. Product and Its Uses**

Woollen Cloth Knitted is used as raw material for the manufacturing of different types of woollen outerwear garments such as gents pullovers, slipovers, ladies cardigans, middies and children wears. To manufacture woollen cloth and to sell to those who are engaged in the manufacturing of above items is a easy work and manageable with a simple knowledge of knitting, machinery and raw materials required to start this industry are indigenously available.

II. Production Targets (Per Annum)

(a) Quantity (Kg)	9000
(b) Value (Rs.)	1341000

III Process of Manufacture

Dyed woollen yarn/mixed yarn on the paper cones is placed on the circular knitting machines and the yarn is converted into knitted cloth by a process known as knitting. By arranging the pattern wheels and different types of colour combinations, variety of designed fabrics can be manufactured. The knitted cloth in the form of rolls is packed and is ready for marketing.

IV. Quality Control Standards

No standard specifications has been formulated so far by the ISI for woollen cloth knitted. Moreover, due to different designs and structure of cloth one quality cannot be maintained. However precautionary steps be taken in purchase of even yarn of required count and fastness of colours.

Prior to purchase of yarn quality may be ensured by getting the sample tested from the Testing laboratory. For purpose of maintaining wales and courses per C.M. and correct count of yarn product specifications IS: 3617—1966 and IS : 4044—1967 may be followed :

V. Land and Building

(a) Covered area	. . . 70 Sq. Mtrs.
(b) Uncovered area	. . . 30 Sq. Mtrs.
(c) Total	. . . 100 Sq. Mts.
(d) Rented value (per month)	Rs. 500.

VI. Machinery and Equipment

S. No.	Description	Imported/ Indigenous	Qty.	Value (Rs.)
1.	12 Wheel jacquard circular knitting machine 14 guage, 24" dia.	Indigenous	1	18,000.00
2.	Interlock circular knitting machine 14 guage 22" dia.	"	1	10,000.00
3.	Electric fittings, Office furniture, Balance etc.	"	—	4,000.00
Total				32,000.00

VII. Raw Materials (per month)

S. No.	Particulars	Imported/ Indigenous	Qty. (Kg)	Rate Rs. Kg.	Value (Rs.)
1.	Dyed woollen yarn or mixed yarn of 22 single 2/32, 2/40 count	Indigenous	760	130	98,800.00

VIII. Staff and Labour (per month)**(a) Administrative & Supervisory**

(i) Manager	1	500	500.00
(ii) Clerk/typist	1	300	300.00
(iii) Peon/Chowkidar	1	200	200.00

(b) Technical (Skilled Unskilled)

(i) Knitting Master	1	500	500.00
(ii) Machine Operators	1	300	300.00
(iii) Packer/Misc. work,	1	200	200.00

Plus pur quisites @15% of Salaries

Total 2,300.00

IX. Other Expenses (Per Month)

(i) Rent of Building	. . . 500
(ii) Electricity charges	. . . 250
(iii) Advertisement & Travelling	. . . 100
(iv) Transport	. . . 100
(v) Consumable stores, needles oils etc.	. . . 100
(vi) Postage expenses/Phones	. . . 100
(vii) Stationery	. . . 100
(viii) Repairs & Maintenance	. . . 150
Total	1,400

Working Capital (for 3 months)

(a) Raw Materials	98800 × 3 =	296400
(b) Salaries & wages	2300 × 3 =	6900
(c) Other expenses	1400 × 3 =	4200
Total		307500

XI. Total Capital Investment

(i) Machinery and Equipments	32,000 ·00
(ii) Working capital for 3 Months	3,07,500 ·00
Total	3,39,500 ·00

XII. Cost of Production (per Annum)

(a) Total recurring Cost per year	12,30,000 ·00
(b) Depreciation on machinery & Equipment @ 10%	3,200 ·00
(c) Interest on Total Investment @ 12%	40,740 ·00
Total	12,73,940 ·00

XIII. Sales Proceeds (per Annum)

S. No.	Item	Qty. (Kg.)	Rate Rs./Kg.	Value (Rs.)
1.	Woollen cloth knitted	9,000	149	13,41,000 ·00

XIV. Profitability (Before Income Tax) (—)1273940

(a) Annual Profit	=	68060
(b) Percentage of Profit on sales		
Annual Net Profit × 100	=	$\frac{68060 \times 100}{1341000} = 5\%$
Annual Sales		1341000

(c) Percentage Profit on investment

$$\frac{\text{Annual Net Profit} \times 100}{\text{Investment}} = \frac{68060 \times 100}{339500} = 20\%$$

XV. Break Even Analysis

$$\frac{(\text{Percentage of Total production envisages}) \text{ Annual fixed Cost} \times 100}{\text{Annual Sales} - \text{Annual Variable Costs}} = 55\%$$

$$\text{Annual Sales} - \text{Annual Variable Costs}$$

XVI. I. Manufacturers/Suppliers of Machinery

- M/s. S.T.M. Knitting Machinery Manufacturers
Kalsi Nagar, G.T. Road, Ludhiana.
- M/s. Sohlson Mechanical Works, Industrial area B
Ludhiana.
- M/s. T. S. Mechanical Works, Janta Nagar,
Ludhiana.
- Saggu Engineering Works,
Gobind Nagar, Ferozepur Road,
Ludhiana.

II. Suppliers of Raw Materials

- M/s. Supreme Woollen Mills,
Industrial area "A" Ludhiana.
- M/s. Reliance Trading Corporation,
303, Industrial Area 'A', Ludhiana.
- M/s. Suraj Hosiery Mills.
Dal Bazar, Ludhiana.
- M/s. Swadeshi Wool Syndicate,
Civil Lines, Ludhiana.

(Reserved item Sl, No. 23).

WOOLLEN GLOVES

I. Products and Its Uses

Woollen gloves is an essential item to cover the hands of human body and protect them from cold during the winter season. Woollen gloves are given to our military jawans & officers especially to those who are serving in the snow area (high mountain hills). The machines required for the manufacturing of woollen gloves are not much costly and are indigenously available. Raw material, i.e. woollen yarn is also easily available in the country.

II. Production Targets (Per Annum)

(a) Quantity (Dozen)	4500
(b) Value (Rs)	342000

III. Process of Manufacture

Dyed woollen yarn from hanks is transferred to the wooden bobbins or paper cones by a process of winding. These bobbins or cones are placed on the knitting machines and gloves are knitted. These knitted gloves are stitched with hand, pressed and packed for marketing.

IV. Quality Control Standards

On this scheme guidelines are given for the manufacturing of woollen gloves required by the Defence authorities which are to be manufactured as per standard specifications laid down in the contract. The product Standard IS: 5450-1969 for woollen gloves may be followed. In the case of woollen gloves for civilian use, so far, no standard specifications are formulated. However, attention must be given to purchase correct count even yarn & fast colours to maintain the quality control of the product :

1. Land & Building

(a) Coverd area (three rooms)	70 sq. Mtrs.
(b) Uncoverd area	30 sq. Mtrs.
(c) Total area	100 sq. Mtrs.
(d) Rental value (Per Month)	Rs. 500/-

VI. Machinery & Equipments

Sl. No.	Description	Imported/ Indigenous	Qty.	Value (Rs.)
1.	Hand operated circular knitting machines 4" dia. 80 needles	Indigenous	3	2,250.00
2.	Hand operated circular knitting machines 4" dia. 76 needles	"	3	2,100.00
3.	Hand wheels	"	2	200.00
4.	Firmas Pressing tables Balance, Electric Press, Office furniture etc.	"	lot	1,450.00
Total				6,000.00

VII. Raw Materials (per month)

S. No.	Particulars	Imported/ Indigenous	Qty.	Value Rs.
1.	Dyed Worsted yarn of 2/10 Count	Indigenous	350 60/-	21,000.00
2.	Cotton yarn, Polythene bags Hessian Cloth Strips strings, etc.	"	"	600.00
Total				21,600.00

VIII. Staff and Labour (per Month)

(a) Administrative & Supervisory			
(i) Manager.	1	500	500.00
(ii) Peon/Chowkidar	1	200	200.00
(b) Technical (Skilled Unskilled)			
(1) Machine operators	6	250	1,500.00
(2) Winding (Ladies)	2	100	200.00
(3) Stitching by hand (Ladies)	4	75	300.00
(4) Pressman	1	300	300.00
(5) Packer/Misc. Work	1	200	200.00
Plus purquisites @15% of salaries			480.00
Total			3,680.00

IX. Other Expenses (per Month)		Rs.
(i) Rent of Building		500
(ii) Electricity charges		40
(iii) Advertisement & Travelling		50
(iv) Transport		40
(v) Consumable stores, needles oils etc.		50
(vi) Postage Expenses/Telephones		50
(vii) Stationery		40
(viii) Repairs & maintenance		50
Total		820

X. Working Capital (for 3 months)		Rs.
(a) Raw Materials	$21600 \times 3 = 64800$	
(b) Salaries & Wages	$3680 \times 3 = 11040$	
(c) Other expenses	$820 \times 2 = 2460$	
Total		78300

XI. Total Capital Investment		Rs.
(a) Machinery & Equipment		6,000.00
(b) Working capital for 3 Months		78,300.00
Total		84,300.00

XII. Cost of Production (per Annum)		Rs.
(a) Total recurring cost per year		3,13,200.00
(b) Depreciation on Machinery & Equipment @ 10%		600.00
(c) Interest on total investment @ 12%		10,116.00
Total		3,23,916.00

XIII. Sales Proceeds (per Annum)

S. No.	Item	Qty Dozens	Rate Rs./Dozen	Value (Rs.)
1	Woollen gloves	4,500	76/-	3,42,000.00
XIV. Profitability (Before income) tax (—)				3,23,916.00

(a) Annual Profit	18084	
(b) Percentage of profit on sales Annual Net profit $\times 100$	18084×100	
Annual sales	342000	= 5.2%
(c) Percentage of profit on investment Annual Net profit $\times 100$	18084×100	
Investment	84300	

XV. Break Even Analysis

(Percentage of total Production envisages) Annual fixed cost $\times 100$	
Annual Sales—Annual variable costs.	= 76%

XVI. Manufacturers/Suppliers of Machinery

- M/s. Kalsi Engineering Works
Neemwala Chowk Ludhiana.
- M/s. Excelicior Mechanical Works
6, Harphool Singh Bldg. Sabzi Mandi,
Delhi-7.
- M/s Om Mechanical Works
Sheepur Road, Sobhani Bldg.
Ludhiana.
- M/s New India Machinery Works
Chawal Bazar, Ludhiana.

II. Suppliers of Raw Materials

- M/s. Swadeshi Wool Syndicate
Civil Lines, Ludhiana.
- M/s. Reliance Trading Corporation
303, Industrial area 'A' Ludhiana.
- M/s. Suraj Hosiery Mills
Dal Bazar, Ludhiana.
- M/s Pearl Spinning Mills
Industrial area 'A', Ludhiana.

(Reserved item Sl. No. 30).

WOOLLEN KNITTED WEAR (OTHER)

I. Product and Its Uses

Wollen/Cashmilon Sweaters keep us warm. They enhance our personality. They just slipover taking the shape of the body and thus are very comfortable. These are a part of uniforms for school children. Manufacture of cashmilon sweaters is very simple and can be managed with a little knowledge of knitting, cutting and stitching of garments. Machinery and raw materials required to start this industry are indigenously available.

II. Production Targets (Per Annum)

(a) Quality (Nos)	7200
(b) Value (Rs)	432000

III. Process of Manufacture

Dyed woollen/Cashmilon yarn in the form of hanks is wound on to the wooden bobbins or paper cones by a winding process. These bobbins or cones are now placed on Flat knitting machines, and yarn is converted into knitted pieces. These knitted pieces are cut to required sizes and stitched first on ordinary lock stitching machine and then are overlocked. These garments are pressed and packed in card board boxes for marketing.

IV. Quality Control Standards

There is a variety of products manufactured from Cashmilon depending upon the different designs, qualities and shapes, hence it is quite difficult to maintain quality control and standards. However, attention must be given to fast colours, correct count of yarn used and correct measurements of garments for which IS: 3617-1966 and IS: 4044-1967 may be followed.

V. LAND AND BUILDING

(a) Covered area	70 Sq. Mts.
(b) Uncovered area	30 Sq. Mtrs.
(c) Total area	100 Sq. Mtrs.
(d) Rented value (Per month)	Rs. 500/-

VI. MACHINERY AND EQUIPMENT

S. No.	Description	Imported/ Indigenous	Qty.	Value
1.	Hand operated Flat knitting machines, 10 gauge 36" width	Indigenous	4	10000
2.	Overlock stitching machine three threads with electric motor	"	1	1500
3.	Footdriven Sewing machines	"	2	1100
4.	Hand wheels	"	2	200
5.	Electric press	"	1	200
6.	Firmas, Pressing lables cutting table, office furniture, balance etc.	"	—	2000
Total				15000

VII. RAW MATERIALS (Per Month)

S. No.	Particulars	Imported/ Indigen- ous	Oty. Kg.	Rate Rs./Kg.	Value (Rs.)
1.	Dyed Cashmilon yarns 2/32 count	Indige- nous	240	100	24000
2.	Cotton yarn, lables sewing thread, buttons etc.	"	—	—	800
3.	Card Board boxes, Polythelene bags, cartoons, etc.	—	—	—	1400
Total s					26200

VIII. STAFF & LABOUR

(a) Administrative and Supervisory				
(i) Manager	1	500	500	
(ii) Peon/Chowkidars	1	200	200	
(b) Technical (Skilled-Unskilled)				
(i) Machine operators	4	500	2000	
(ii) Cutter master	1	500	500	
(iii) Overlock machine operator	1	300	300	
(iv) Sewing machine	2	250	500	
(v) Pressman	1	300	300	
(vi) Winding (ladies)	2	100	200	
(vii) Misc work	1	200	200	
				4700
Plus Perquisites @15% of salaries				705
Total				5405

IX. OTHER EXPENSES
(Per Month)

(i) Rent of Building	500
(ii) Electricity charges	50
(iii) Advertisement and Travelling	250
(iv) Transport	50
(v) Consumable stores, needles, oil etc.	150
(vi) Postage expenses/Telephones	100
(vii) Stationery	100
(viii) Repairs & Maintenance	95
Total	1295

X. WORKING CAPITAL (For 3 Months)

(a) Raw Materials	26200 × 3 = 78600
(b) Salaries & wages	5405 × 3 = 16215
(c) Other expenses	1295 × 3 = 3885
Total	98700

XI. TOTAL CAPITAL INVESTMENT

(1) Machinery & Equipment	15000
(2) Working capital for 3 month	98700
Total	113700

XII. COST OF PRODUCTION (Per Annum)

(a) Total recurring cost per year	394800
(b) Depreciation on machinery & equipment @ 10%	1500
(c) Interest on total investment @ 12%	13644
Total	409944

XIII. SALES PROCEEDS (Per Annum)

S. No.	Item	Qty. Nos.	Rate Rs./Nos	Value (Rs.)
1.	Woollen/Cashmilon Sweaters, Pullovers Cardigans	7200	60/-	432000

XIV. PROFITABILITY (Before income tax) (—)

(a) Annual Profit = 22056

(b) %age of profit on sales

$$\frac{\text{Annual Net profit} \times 100}{\text{Annual Sales}} = \frac{22056 \times 100}{432000} = 5.1\%$$

(c) %age of profit on investment

$$\frac{\text{Annual Net profit} \times 100}{\text{Investment}} = \frac{22056 \times 100}{113700} = 20\% \text{ (App.)}$$

XV. BREAK EVEN ANALYSIS

(%age of total production envisaged)

$$\frac{\text{Annual fixed cost} \times 100}{\text{Annual sales} - \text{Annual variable costs}} = \text{B.E.P.} = 70\%$$

XVII. MANUFACTURE SUPPLIERS OF MACHINERY

1. M/s Jagdev Engineering Works, Industrial Area 'A' Ludhiana.
2. M/s Paul Machinery Works, Gaushala Road, Ludhiana.
3. M/s Elex Engineering Works, Jail Road Ludhiana.
4. M/s Malkiat Mechanical Works Khavadian Bazar Ludhiana.

II. SUPPLIERS OF RAW MATERIALS

1. M/s Navyug Woollen, Mills, Industrial Area 'A', Ludhiana.
2. M/s Reliance Trading Corporation, 303, Industrial Area 'A' Ludhiana.
3. M/s Youngman Hosiery Mills, Dal Bazar, Ludhiana.
4. M/s Suraj Hosiery Mills, Dal Bazar, Ludhiana.

(Reserved item Sl. No. 32)

WOOLLEN MUFFLERS KNITTED

I. Product and Its Uses

Woollen mufflers are generally used by gents during winter season especially in the hilly areas, to protect neck and head portion of the body from cold. Being a very cheap product it comes within the easy reach of common man, hence there is ample scope to start this industry in any part of India-town & villages. The manufacture of mufflers is a very simple industry and can be managed with a little knowledge of knitting. Moreover, machinery and raw materials required to start this industry are indigenously available.

II. Production Targets (Per Annum)

(a) Quantity (Dozens)	3600
(b) Value (Rs)	655200

III. Process of Manufacture

Dyed Woollen/mixed yarn in different shades is purchased from the market and is wound on the wooden bobbins by a process known as winding. These bobbins are placed on Hand operated circular knitting machines and yarn is converted into a (knitted cloth). This knitting cloth is cut into pieces as per length of mufflers required. Both ends of these cut pieces are stitched or overlocked and fringes are attached with hand process by ladies. The mufflers are then pressed and packed in card board boxes and marketed.

IV. Quality Control Standards

As per product proposed for manufacturing is a fashioned item having different designs and colour combinations depending upon the demand of the consumers, so proper quality control on the product is not possible to be maintained. However, quality control in regards to quality of yarn in respect of eveness and correct count and colour fastness can be maintained. For this proposed product specification IS: 2422-1963 may be followed.

V. Land and Building.

	sq. Mtrs.
(a) Covered area (3 rooms)	70
(b) Uncovered area	30
(c) Total area	100
(d) Rental value (Per Month)	Rs. 500

VI. Machinery & Equipment

S. No.	Description	Imported Indigenous	Qty Kg.	Value Rs.
1.	Hand operated Circular knitting machines with designs wheels 6½" dia. 300 needles.	Indigenous	4	4000
2.	Overlook machine three thread with motor	"	1	1500
3.	Firmas, Pressing table Wooden stands, electric press, office furniture.	"	lot	2000
4.	Sewing machines	"	1	500
Total				8000

VII. Raw Materials (Per Month)

S. No.	Particulars	Imported/ Indigenous	Qty Kg.	Rate Rs/Kg.	Value (Rs.)
1.	Woollen/mixed yarn of 2/40 or 2/32 count	Indigenous	360	125	45000
2.	Polythelene bags, Cord board boxes, sewing thread, tables etc.	"	—	—	950
Total					45950

VIII. Staff and Labour

(a) Administrative & Supervisory				
(1)	Manager	1	500	500
(2)	Peon/Chowkidar	1	200	200
(b) Technical (skilled-unskilled)				
(1)	Machine operators	4	250	1000
(2)	winding (ladies)	2	100	200
(3)	Overlock machine operator	1	250	250
(4)	Lables & frings (Bom- bles) attachment (ladies)	5	70	350
(5)	Pressman	1	300	300
(6)	Packer/Misc. man	1	200	200
				3000
Plus perquisites @15% of salaries				450
				3450

IX. Other Expenses (Per Month)

(1) Rent of Building	500
(2) Electricity charges	50
(3) Advertisement & Travelling	50
(4) Transport	50
(5) Consumable stores, needles oils etc.	100
(6) Postage expenses Telephones	50
(7) Stationery	50
(8) Repairs & Maintenance	100
Total	950

X. Working Capital (For 3 Months)

(a) Raw materials	$45950 \times 3 = 137850$
(b) Salaries & wages	$3450 \times 3 = 10350$
(c) Other expenses	$950 \times 3 = 2850$
Total	151050

XI. Total Capital Investment.

(a) Machinery & Equipment	8000
(b) Working capital for 3 months..	151050
Total	159050

XII. Cost of Production (Per Annum)

(a) Total recurring cost of per year.	604200
(b) Depreciation on machinery & equipment @ 10%	800
(c) Interest on total investment @ 12 %	19080
Total	624080

XIII. Sales Proceeds (Per Annum.)

S. No.	Item	Qty Dozens	Rate Rs/Dozen	Value (Rs.)
1.	Woollen mufflers knitted	3600	182	655200

XIV. Profitability (Before income tax) (—) 624080

(a) Annual Profit 31120

(b) %age of Profit on sales.

$$\frac{\text{Annual Net Profit} \times 100}{\text{Annual sales}} = \frac{31120 \times 100}{655200} = 5\% \text{ (App.)}$$

(c) %age of Profit on Investment.

$$\frac{\text{Annual Net Profit} \times 100}{\text{Investment}} = \frac{31120 \times 100}{159050} = 20\% \text{ (App.)}$$

XV. Break Even Analysis.

(%age of total production envisaged Annual Fixed cost $\times 100$

$$= 65\%$$

Annual sales—Annual variables cost.

XVI. Manufacturers/suppliers of Machinery.

- (1) M/s. Om Mechanical Works, Shahpur Road, Sobhani Bldg, Ludhiana.
- (2) M/s. Kalsi Engineering Works, Neemwals Chowk Ludhiana,
- (3) M/s. New India Machinery Works, Chawal Bazar, Ludhiana.
- (4) M/s. Excelcior Mechanical Works, 6, Harphool Singh Bldg., Sabzi Mandi, Delhi-110007.

II. Suppliers of Raw Materials.

- (1) M/s. Swedeshi Wool Syndicate, Civil Lines, Ludhiana.
- (2) M/s. Suraj Hosiery Mills, Dal Bazar, Ludhiana.
- (3) M/s. Reliance Trading Corporation, 303, Industrial area, 'A' Ludhiana.
- (4) M/s. Pearl Spinning mills, Industrial 'A' Ludhiana.

(Reserved item Sl. No. 31).

WOOLLEN SCARVES KNITTED**I. Product and Its Uses**

Woollen scarves knitted are very much resembles to woollen mufflers. The difference is only of its more width and less length than the mufflers. Scarves are used by ladies during winter season. This is not used only for protection from cold but it is more used as a item of fashion. Manufacture of woollen scarves knitted is very simple and easily manageable with a little knowledge of Flat Knitting machines (which can be learnt within a short period) Machines and raw materials required to start this industry are indigenously available. This industry has good scope to be started in rural areas of the country.

II. Production Targets (Per Annum)

(a) Quantity (Dozens)	6000
(b) Value (Rs.)	1080000

III. Process of Manufacture

Dyed Woollen yarn, from hanks is wound on to the bobbin or paper cones, by a process known as winding. These bobbins or cones are placed on the Flat Knitting machines and yarn is converted into knitted cloth. This knitted cloth is spread on the table and required lengths of scarves are cut by hand scissors. Both ends of the cut pieces are overlocked and a beautiful net of fringes (bambles) on both the ends is made by hand. The scarves now pressed and packed in polythylene bags and finally in card board boxes for marketing.

IV. Quality Control Standards

As Woollen knitted scarves is a item of fashion, the quality and standards will differ from lot to lot. However, to maintain quality to some extent attention must be given to use woollen yarn of right count and of fast colours.

V. Land & Buildings.

	sq. Mtrs.
(a) Covered area (3 Rooms)	70
(b) Uncovered area	30
(c) Total area.	100
(d) Rental value (Per month)	Rs. 500

VI. Machinery & Equipments

S. No.	Description	Imported Indigenous	Qty	Value.
1.	Hand operated Flat knitting machines 24" width 10 guage	Indigenous	4	7000
2.	Overlock stitching machine three threads with motor	"	1	1500
3.	Hand wheels	"	2	200
4.	Cutting & Pressing tables Electric iron, office furniture.	"	lot	1300
Total				10000

VII. Raw materials (Per Month).

S. No	Particulars	Imported/ Indigenous	Qty Kg	Rate Rs/Kg	Value (Rs.)
1.	Woollen yarn 2/22 or 2/32 count	Indigenous	600	127	76200
2.	Sewing thread, tables Polythelene bags, card board boxes, etc.	"	—	—	2000
Total					78200

VII. Staff & Labour (per month)**(a) Administrative & Supervisory**

(i) Manager	1	500	500
(ii) Peon/Chowkidar	1	200	200

(b) Technical (Skilled-unskilled)

(i) Machine operators	4	300	1200
(ii) Winding (ladies)	2	100	200
(iii) Overlock machine operators	1	250	250
(iv) Fringe (Bundles)	4	100	400
(v) Pressman	1	250	250
(vi) Packer/Misc. work	1	200	200

			3200
Plus perquisites @ 15% salaries			480
Total			3680

IX. Other Expenses (Per Month)

(1) Rent of Building	500
(2) Electricity charges	40
(3) Advertisement & Travelling	100
(4) Transport	40
(5) Consumable stores, needles, oils, etc.	100
(6) Postage expenses Tele-phones	50
(7) Stationery	40
(8) Repairs & Maintenance	50
Total	920

X. Working Capital (For 3 Months)

(a) Raw materials	78200 x 3 = 234600
(b) Salaries & wages	3680 x 3 = 11040
(c) Other expenses	920 x 3 = 2760
Total	248400

XI. Total Capital Investment

(a) Machinery & Equipment	10000
(b) Working capital for 3 Months.	248400
Total	258400

XII. Cost of Production (Per Annum.)

(a) Total recurring Cost per year	993600
(b) Depreciation on machinery & Equipment @ 10%	1000
(c) Interest on Total investment @ 12 %	31008
	102508

XIII. Sales Process (Per Annum.)

S. No. Item	Qty Dozens	Rate Rs./ Kg.	Value (Rs.)
1. Woollen scarves knitted	6000	180	1080000

XIV. Profitability (Before Income tax (—) 1025608

(a) Annual Profit	54392
(b) %age of Profit on Sales.	
Annual net Profit x 100	54392 x 100
Annual sales	1080000
(c) %age of Profit on investment.	
Annual net profit x 100	54392 x 100
Investment	258400

XV. Break Even Analysis.

(% of total Production envisaged)	
Annual fixed cost x 100	
Annual sales—Annual variable costs.	= 55%

XVI. Manufacturers/Suppliers of Machinery.

- (1) M/s. Jagdev Engineering Works. Industrial area 'A' Ludhiana.
- (2) M/s. Paul Machinery Corporation, Gaushala Road, Ludhiana.
- (3) M/s. Elex Engineering Works, Jail Road, Ludhiana.
- (4) M/s. Malkiat Mechanical Works. Kharadian Bazar, Ludhiana.

Suppliers of Raw Materials.

- (1) M/s. Supreme Woollen mills, Industrial area 'A' Ludhiana.
- (2) M/s. Pearl spinning Mills. Industrial area 'A' Ludhiana.
- (3) M/s. Reliance Trading Corporation, Industrial Area 'A' Ludhiana.
- (4) Suraj Hosiery Mills, Dal Bazar, Ludhiana.

(Reserved item Sl. No. 26).

WOOLLEN SOCKS KNITTED

I. Product and Its Uses

Woollen socks are one of the essential item for our military Jawans, police, Home guards, NCC and ACC Cadets, There are other Central and State Govt. Departments where these socks are given in the winter season to the Class IV Employees. Manufacture of Woollen socks involves very simple operations and is easily manageable with the available knowledge of socks knitting machines, which is very simple and can be learned within a short time. Moreover, machinery and raw materials required for the manufacture of Woollen socks are indigenously available

II. Production Targets (Per Annum)

(a) Quantity (Dozens)	6000
(b) Values (Rs)	504000

III. Process of Manufacture

Dyed woollen yarn in required shades like Khaki, Navy blue and olivegreen is wound on the wooden bobbins from hanks with the help of hand wheels. These bobbins are then placed on the Hand operated socks knitting machine. Yarn is converted into knitted socks. The portion of the socks is linked by hand needle. The socks are washed if need be, pressed and packed finally.

IV. Quality Control Standards

Woollen socks are generally purchased by the D.G.S. & D. for military Jawans or for Police or Home guards and standard specifications are given in the contract. Precautions must be given in purchasing woollen yarn of required count. During production, time to time socks may be checked for Nos. of courses and wales per C.M. measurements etc. product specification, IS: 2187-1973 may be followed to keep proper quality control of the product.

V. Land Building

(a) Covered area	70 Sq. Mtrs.
(b) Uncovered area	30 Sq. Mtrs.
(c) Total area	100 Sq. Mtrs.
(d) Rental value (Per month)	Rs. 500

VI. Machinery & Equipments

S. No.	Description	Imported indigenous	Qty	Value (Rs.)
1.	Hand Operated Socks Knitting machines. 4½" dia. 84 needles.		Indigenous 3	2400
2.	Hand operated socks & knitting machines 4" dia. 80 needles.		2	1500
3.	Hand operated socks knitting machines 4" dia 76 needles.		2	1400
4.	Hand wheels (Winding)		2	200
5.	Electrical iron, wooden tables, bobbins, films, office furniture stools etc.		lot	2500
Total				8000

VII. Raw materials (Per Month)

S. No.	Particulars	Imported indigenous	Qty (kg.)	Rate Rs./Kg.	Value (Rs.)
1.	Dyed woollen yarn 3/11 and 11 single count Indi.		510	65	33150
2.	Cotton yarn, 20 single indi.		..	..	150
Total					333000

VIII. Staff & Labour (Per Month)

(a) Administrative & Supervisory

(i) Manager	1	500	500
(ii) Clerk/Typist	1	300	300
(iii) Peon/Chowkidar	1	200	200

(b) Technical (skilled Unskilled)

(1) Machine operators	7	250	1750
(2) Winding (ladies)	2	75	150
(3) Linking by hand (ladies)	3	100	300
(4) Pressmen	2	300	600
(5) Packers/Misc. work	1	200	200

			3700
Plus Perquisites @ 15% of salaries			555
Total			4255

IX. Other Expenses (Per Month)

(1) Rent of Building . . .	500
(2) Electricity charges . . .	50
(3) Advertisement & Travelling . . .	50
(4) Transport . . .	50
(5) Consumable stores, needles oils . . .	50
(6) Postage expenses/Phones . . .	50
(7) Stationery . . .	50
(8) Repairs & Maintenance . . .	45
	<u>845</u>

X. Working Capital (For 3 Months)

(a) Raw materials . . .	$33300 \times 3 = 99900$
(b) Salaries & wages . . .	$4255 \times 3 = 12765$
(c) Other expenses . . .	$845 \times 3 = 2535$
Total . . .	<u>115220</u>

XI. Total Capital Investment

(a) Machinery & Equipment . . .	8000
(b) Working capital for 3 months.. . .	115200
Total . . .	<u>123200</u>

XII. Cost of Production (Per Annum)

(a) Total recurring cost per year . . .	460800
(b) Depreciation on machinery & equipment @10% . . .	800
(c) Interest on total investment @ 12% . . .	14784
Total . . .	<u>476384</u>

XIII. Sales Proceeds (Per Annum.)

S. No.	Item	Qty Doz.	Rate Rs./Dozens	Value (Rs)
1.	Woollen Socks . . .	6000	84	504000

XIV. Profitability (Before income tax) (—) 476384

(a) Annual Profit=27616

(b) %age of Profit on sales.

$$\frac{\text{Annual Net Profit} \times 100}{\text{Annual sales}} = \frac{27616 \times 100}{504000} = 5.5\% (\text{App.})$$

(c) % age of Profit on Investment.

$$\frac{\text{Annual Net Profit} \times 100}{\text{Investment}} = \frac{27616 \times 100}{123200} = 22\%$$

XV. Break even Analysis**I. Manufacturers suppliers of Machinery.**

- (i) M/s. Popular Mechanical & Electrical Works.
Chawal Bazar, Ludhiana.
- (ii) M/s. Om Mechanical Works,
Shahpur Road, Sobhani Bldg, Ludhiana.
- (iii) M/s. Kalsi Engineering Works.
Neemwala Chowk Ludhiana,
- (iv) M/s. Excelcior Mechanical works.
6, Harphool singh, Bldg, Sabzi Mandi, Delhi-7.

II. Suppliers of Raw Materials

- (i) M/s. Swadeshi Wool Syndicate,
Civil Lines, Ludhiana,
- (ii) M/s. Suraj Hosiery Mills,
Dal Bazar, Ludhiana.
- (iii) M/s. Reliance Trading Corporation,
303, Industrial area, A, Ludhiana.
- (iv) M/s. Pearl Spinning mills.
Industrial area A, Ludhiana

(Reserved item Sl. No. 25)

WOOLLEN UNDERGARMENTS KNITTED**I. Products and Its Uses**

Woollen undergarments knitted include woollen underpants and woollen drawers. In this scheme guidelines for the manufacturing of underpants is given. Woollen underpants are used by males and females to cover bottom part of their bodies, during the winter season. This is the essential requirements of people living on hilly areas. The manufacturing of underpants is very simple and easily manageable with a little knowledge of Flat Knitting machine. The machines and Raw Materials, required to start this industry, are indigenously available. This industry has good scope to be started in the rural areas of the country.

II. Production Targets (Per Annum)

(a) Quantity (Dozens)	1200
(b) Value (Rs)	510000

III. Process of Manufacture

Woollen yarn and cotton yarn on cones purchased from the market are placed on the Flat Knitting Machines and pieces for underpants are knitted. These pieces are pressed and cut per required sizes. These cut pieces are stitched first by lock stitch sewing machine and then are overlocked. The underpants are then pressed and packed for marketing.

IV. Quality Control Standards

Woollen underpants purchased by DGS&D for military requirements are required to be manufactured as per standard specification (IS: 5524-1969) laid down in the contract. Underpants manufactured for civilian requirements have no proper standards to be followed and pants are manufactured as per buyer's demand. However the above-mentioned Standards can be followed as guidelines and attention must be paid to the correct count of yarn and to maintain proper numbers of walls & courses per c.m.

V. Land and Building

(a) Covered area (Three rooms)	70 Sq. Mtrs.
(b) Uncovered area	30 Sq. Mtrs.
(c) Total area	100 sq. Mtrs.
(d) Rental Value (Per Month)	Rs. 500-00

VI. Machinery and Equipment

S. No.	Description	Imported/ Indi- genous	Qty	Value (Rs.)
1.	Hand Operated Flat Knitting machines 10 gauge, 40" width	Indigenous	4	10000-00
2.	Overlock stitching machine 3 threads with Motor	"	1	1500-00
3.	Sewing machines	"	1	500-00
4.	Firmas, Electric iron, pressing & Cutting tables Office furniture			3000-00
Total				15000-00

VII. Raw Materials (Per Month)

S.No.	Particulars	Indi- genous Imported	Qty Kg.	Rate Rs/kg.	Value (Rs)
1.	Woollen yarn 1/22 Worsed count	Indigenous	240	120	28800-00
2.	Cotton yarn 1/20 single count	"	160	20	3200-00
3.	Sewing thread, tables, Cotton tape, Polythylene Bags, strips etc.	"	lot		2400-00
Total					34400-00

VIII. Staff and Labour (Per Month)**(a) Administrative and Supervisory**

(i) Manager	1	500	500-00
(ii) Peon/Chowkidar	1	200	200-00

(b) Technical (Skilled/Unskilled)

(i) Machine Operator	4	300	1200-00
(ii) Cutters Master/Over locker	1	400	400-00
(iii) Stitcher	1	250	250-00
(iv) Pressman	1	250	250-00
(v) Packer/Misc work	1	200	200-00

3000-00

Plus Perquisites @ 15% of salaries

450-00

3450-00

IX. Other Expenses (Per Month)

(i) Rent of Building	500.00
(ii) Electricity charges	50.00
(iii) Advertisement & Travelling	120.00
(iv) Transport	60.00
(v) Consumable stores, needles, oil etc.	100.00
(vi) Postage expenses/Telephones	60.00
(vii) Stationery	60.00
(viii) Repairs & Maintenance	100.00
Total	1050.00

X. Working Capital (For 3 Months)

(a) Raw Materials	$34400 \times 3 =$	10320.00
(b) Salaries & Wages	$3450 \times 3 =$	10350.00
(c) Other expenses	$1050 \times 3 =$	3150.00
Total		116700.00

XI. Total Capital Investment

(a) Machinery & Equipment	15000.00
(b) Working capital for 3 Months	116700.00
Total	131700.00

XII. Cost of Production (Per Annum)

(a) Total recurring cost per year	466800.00
(b) Depreciation of machinery of equipment @10%	1500.00
(c) Interest on total investment @12%	15804.00
Total	484104.00

XIII. Sales Proceeds (Per Annum)

S. N.	Item	Qty (Dozens)	Rate Rs./dozen	Value (Rs.)
1.	Woollen underpants knitted	1200	425.00	510000.00
XIV. Profitability (Before Income Tax) (—)				484104.00

(a) Annual Profit = 25896

(b) %age of profit on sales

$$\frac{\text{Annual Net profit} \times 100}{\text{Annual sales}} = \frac{25896 \times 100}{510000} = 5\%$$

(c) %age of profit on investment.

$$\frac{\text{Annual Net profit} \times 100}{\text{Investment}} = \frac{25896 \times 100}{131700} = 19.6\%$$

XV. Break Even Analysis

(%age of total Production envisaged)

$$\frac{\text{Annual fixed Cost} \times 100}{\text{Annual sales} - \text{Annual Variable costs}} = 54\%$$

XVI. A. Manufacturers/Suppliers of Machinery

- M/s. Malkiat Mechanical Works
Kharadian Bazar Ludhiana
- M/s. Pauls Machinery Corporation,
Gaushala Road, Ludhiana.
- M/s. Jagdev Engineering Works,
Industrial Area 'A' Ludhiana.
- M/s. Elex Engineering Works,
Jail Road, Ludhiana.

B. Suppliers of Raw Materials

- M/s. Vardhman Spinning & General Mills
UTB Samrala Road, Ludhiana.
- M/s. Swadeshi Mfg. Syndicate
Civil Lines, Ludhiana.
- M/s. Supreme Woollen Mills,
Industrial Area 'A', Ludhiana
- M/s. Suraj Hosiery Mills
Dal Bazar, Ludhiana.

(Reserved item Sl. No. 27)

Hosiery Industries **13** WOOLLEN VESTS KNITTED WOOLLEN WINTER VESTS

I. Product and Its Uses

Vest is an underwear garment and as its name denotes it is suitable for winter season. Vest is an essential item for men to wear under the shirt to keep the body warm in the winter and also to prevent the shirt from the perspiration. Woollen and cotton mixed vests have more warmth than the cotton vests, as such these are being given to military and para military departments alongwith their uniforms, to be wearred during the winter season. These type of vests have also a very good demand all over the country. In this scheme guidelines are only for civilian type of vests in light weight. Machinery and raw materials required for the manufacture of woollen vests is indigenously available.

II. Production Targets (Per Annum)

(a) Quantity (Dozens)	12000
(b) Value (Rs)	1248000

III. Process of Manufacture

Woollen yarn and cotton yarn on paper cones is placed on the knitting machines and converted into knitted fabric in tube shape. The cloth is washed and pressed, Washed and pressed cloth is spread on the cutting tables and requisite sizes are cut with the help of hand scissors. These cut pieces are stitched, pressed and are ready for despatch.

IV. Quality Control Standards

Generally this item is manufactured as per orders received from the DGS&D which are as per the specifications standards laid down in the contract. However, product specification IS: 3330-1965 for vests wool-cotton may be followed. To keep quality control, attention may be given to purchase of yarn of good quality and specified count and maintenance of wales and courses in the fabrics.

V. Land and Building

(a) Covered area	70 Sq. Mtrs.
(b) Uncovered area	30 Sq. Mtrs.
(c) Total area	100 Sq. Mtrs.
(d) Rented value (Per month)	Rs. 500.00

VI. Machinery and Equipment

S. No.	Description	Imported/ Indigenous	Qty	Value (Rs.)
1.	Power operated round knitting machines 18" 19" dia. gauge 18 with electric motors.	Indigenous	2	16000.00
2.	Chain stitching machine with electric motor			1000.00
3.	Overlock machine with Electric motor & attachment	1	2	3000.00
4.	Flat lock stitching machine with electric motor.	"	1	5000.00
5.	Electric Press, Pressing, a cutting lables, Office furniture, stools, installation etc.		lot	5000.00
Total				30000.00

VII. Raw Materials (Per Month)

S. No.	Particulars	Imported/ Indigenous	Qty Kg.	Rate Rs/Kg	Value (Rs)
1.	24 Single count woollen yarn	Indigenous	600	120.00	72000.00
2.	20 single count cotton yarn	"	700	20.00	11000.00
3.	Lables, Sewing thread silk thread, etc.	"	—	—	4000.00
Total					90000.00

VIII. Staff and Labour (Per Month)

(a) Administrative & Supervisory				
(i)	Manager		1	500
(ii)	Clerk/Typist		1	300
(iii)	Peon/Chowkidar		1	200
(b) Technical (Skilled-Unskilled)				
(i)	Knitting master		1	500
(ii)	Cutting master		1	400
(iii)	Stitchers		4	300
(iv)	Pressman.		1	300
(v)	Pakers/Misc. work		1	200
Plus perquisites @15% of salaries				540.00
Total				4140.00

IX. Other Expenses (Per Month)		Rs.
(i) Rent of Building		500.00
(ii) Electricity charges		200.00
(iii) Advertisement & Travelling		100.00
(iv) Transport		100.00
(v) Consumable stores, needles, oils etc.		100.00
(vi) Postages expenses/Telephones		100.00
(vii) Stationery		100.00
(viii) Repairs & Maintenance		160.00
Total		1360.00

X. Working Capital (For 3 Months)		Rs.
(a) Raw materials	90000 × 3 =	270000.00
(b) Salaries & wages	4140 × 3 =	12420.00
(c) other expenses	1360 × 3 =	4080.00
		286500.00

XI. Total Capital Investment		
(i) Machinery and Equipment		30000.00
(ii) Working capital for 3 months		286500
Total		316500

XII. Cost of Production (Per Annum)		Rs.
(a) Total recurring Cost per year		1146000
(b) Depreciation on machinery & equipment @ 10%		3000
(c) Interest on total investment @ 12%		37980
		1186980

XIII. Sales Proceeds (Per Annum)

S. No.	Items	Qty Dozen	Rate Rs/Doz.	Value Rs.
1.	Woollen vests knitted	12000	104	1248000

XIV. Profitability (Before income tax) (—) 1186980		Rs.
(a) Annual Profit		61020
(b) %age of Profit on sales.		
Annual Net profit × 100	$\frac{61020 \times 100}{1248000}$	= 5%
Annual sales		
(c) %age of Profit on investment		
Annual Net Profit × 100	$\frac{61020 \times 100}{3165000}$	= 20%
Investment		

XV. Break Even Analysis.

(% of total production envisaged)	
Annual fixed cost × 100	= 60%
Annual sales—Annual variable costs.	

XVI. Manufacturers/Suppliers of Machinery

1. M/s. Matharoo Mechanical works.
Ferozpur Road, Ludhiana.
2. M/s. P. S. Mechanical Works,
Janta Nagar, Ludhiana.
3. M/s. S. T. M. Knitting machine Manufacturers,
Kalsi Nagar, G. T. Road, Ludhiana.
4. M/s. Sohlson Machinery Works,
Industrial area 'A' Ludhiana.

II. Suppliers of Raw Materials

1. M/s. Swadeshi Wool Synidcate,
Civil lines, Ludhiana.
2. M/s. Suraj Hosiery Mills,
Dal Bazar, Ludhiana.
3. M/s. Vardhaiang Spinning Mills,
Samrala Road, Ludhiana.
4. M/s. Beni Parsad & Co.
Chaura Bazar, Ludhiana.

(Reserved item Sl. No. 24)

**LEATHER AND SPORTS GOODS
INDUSTRIES**

A. Introduction

Football is one of the most popular games in the world and its demand is global. There are other types of leather balls, such as Volleyball, Basket ball, Rug by ball, hand ball, net ball, throw ball, punching ball and water polo ball, etc. India's exports of Sports Goods is about Rs. 18 crore per annum (1978-79). Among this football and other type of balls, constitute about Rs. 12 crores. In total export of leather balls, the share of football is about 95% and remaining 5% account for rug by ball, handball, net ball, throw ball, punching ball, etc. Volley balls, Basket balls and water polo balls are not being exported since in the foreign countries the demand is met by synthetic rubber and nylon wounded cemented balls. The volley balls etc. are being manufactured primarily to meet domestic demand. Net ball and throw balls are similar to volley balls, and hand balls. It is manufactured to a very limited extent.

Present Status of the Industry

Leather balls are mostly made at Jullundur, Meerut and Calcutta and to little extent at Delhi, Batala and other places. In Jullundur about 500 organised and unorganised units are working, employing about 4000 workers. About 75% of the total footballs, production is manufactured at Jullundur and rest 25% at other places. Approximately 30 to 40 lakh pieces of footballs (including all types of balls) are being manufactured at Jullundur and Batala, and about 10 to 15 lakh pieces are made at other places. About 15 units are at Delhi, 100 units at Meerut and 50 units at Calcutta employing about 1000 workers.

Scope

It has been studied from the demand pattern that the manufacturing activities increases or decreases on the basis of foreign orders. The unit receives major orders generally from West Germany, U.K., U.S.A., Australia, and other European countries. The demand for rug by ball is mostly from Australia. The number of cottage units correspondently decrease or increase as per the demand. The internal demand is only for about 10 lakh pieces per

annum. This is being met mostly by the manufacturers of Jullundur, Delhi, Meerut and Calcutta. About 80% of the Production at Jullundur is exported and 50% of production from Delhi and Meerut. Although the foreign countries like Taiwan and Japan have come up with synthetic products yet they are not able to produce cheaper hand stitched footballs due to high labour costs. Most of the foreigners play football during week and holidays at beaches and in schools etc. In India also the demand is increasing due to popularisation of the game of football, Volleyball etc. Mostly the increasing demand is being met by the existing manufacturers but still there is a scope for about 40 to 50 new units for meeting the internal and export demand due to increase in popularisation of the game.

Thirteen to fourteen pieces of E.I. kips having weight between 4 to 5 kg. per piece is required to get an area of about 300 sq. ft. after removing the thin belly portion. In case of bag tanned leather which is comparatively cheaper and heavier about 650 grams leather is required for football as compared to E.I. leather where 500 to 600 grams of leather is used per football.

B. Technical Aspects

(i) Process of Manufacture :

70 to 80% of the total football produced is manufactured from E. I. Kips the rest 20 to 30% is made from bag tanned cow hides. All the football manufacturers take the crust leather from the market, semichrome and finish it by themselves to ensure the quality of the products. Since finished leather for making football like upper leather for shoes is not available from the tanneries, processing of crust leather have to be done by the unit itself. Similarly, stretched unfinished full chrome leather available in the market also have to be finished by the unit for manufacturing footballs. That is why provision has been made in the scheme for leather processing machine like shaving, buffing and wooden drums. E. I. Kips are preferred because of being lighter in weight and therefore require less shaving to get the desired thickness of 2.4 to 2.5 mm. Whereas

bag tanned leather has to be shaved more in order to get the required thickness. E. I. tanned leather is mellower as compared to bag tanned leather having almost uniform thickness, but the advantage in bag tanned leather is of lesser stretch as compared to E. I. leather. The kips are rounded. First the thinner belly portion and the back bone portion is taken off and is sold out to the chappal and desi juthi manufacturers. Then for first quality football, rugby ball, butt portion is taken and for second quality football and volley balls the neck and chest portions are taken. For third quality, the loose shoulders and thick belly portion is used. The rounded leather pieces are shaved to a uniform thickness of 2.4 to 2.5 mm for football, rugby ball, basket ball and hand ball. For volley ball and punching ball, the chest portion is shaved to 2 to 2.2 mm. Then shaved leather is put into the drum with sufficient quantity of water stripped with soda ash, washed and semichromed with 3 to 4% chrome powder and half a percent of salt (on the shaved weight). The goods are piled overnight and next day washed thoroughly neutralised with $\frac{1}{4}$ % soda bi-carb and then fatliquered with 6 to 7% T.R.O. and 1% groundnut oil. The leather is sammed and is stretched with slickers. The leather is worked so as to remove the stretch as far as possible. Then the leather is dried completely and snuffed lightly. The pigment solution with binder are applied, 4 to 6 coats to ensure complete coverage. After drying, tallow mixture made out of 2 kg. of tallow and 1 kg. of mustered oil is applied on the flesh side and pieces are kept over night. Next day, they are hand staked and the leathers are taken for clicking.

Clicking of the Leather

When the leather is ready, it is clicked with the help of prepunched dies of the required shape and the design. Different designs of footballs like T. shape, 18 panels, 32 panels and 48 panels are being manufactured. Seamless bladders, viz., pin hole or pump hole are used in these patterns in preference to sheet bladders with tube as they help in maintaining the shape of a football. An expert clicker using wooden plank and a sharp—prepunch—clicking die can click pieces for more than 30 balls a day by means of a power operated clicking press. The clicked panels are paired and weighed with bladder together to get proper weight of the ball.

Stitching

Stitching a football is not simple but a very skillful operation. The final shape of the ball depends upon the correctness of stitching. The thread used must be strong and capable of lasting for months under severe conditions. Rot proof, waxed, 5 to 6 ply hemp thread is

used for the purpose. Stitching is done by means of two needles. In the preliminary stages, a wooden clamp is used to hold the pieces together. When stitching progresses, clamps may not be required as the material could be held between the legs.

Only lock stitching is suitable since each stitch is complete by itself. If one stitch breaks or thread snaps somewhere in the middle, it weakens only one stitch. The snapping of a thread at any particular point does not affect the rigidity of the adjoining stitches. Stitches should be well stretched and should have 9 stitches in 4.5 cms. They should also be parallel to the edge. When the ball is fully inflated, the thread that is visible should not be more than 2 mm deep from the surface of the ball. For making the thread water proof a composition prepared from 100 gms. resin, 200 grms. rawl and 400 to 500 grms of mustered oil is used. Resin and rawl in proper proportions are melted separately, mustered oil added mixed together and allowed to cool. When cool, the mixture must have sufficient consistency which will easily adhere to the thread. The thread is held tight between the feet and the hands and the composition is applied several times till the required quantity adhere to the surface of the thread. Slight defects in stitching would result in a ball not having proper shape. While it may be possible to remedy minor defects, major ones cannot be remedied and therefore great care is required to be taken in stitching. Bees wax is applied on thread for easy stitching.

Finishing operations in stitching

The stitching operations are done inside out. The ball has to be turned out finally so that the grain side is out and the flesh side of the panel is inside. To achieve this kind of stitching, if a ball consists of 32 pieces 30 pieces, are stitched properly and the 31st and 32nd pieces are left incomplete. The whole ball is now turned out through the opening in the partially stitched 31st and 32nd piece. This operation requires a lot of skill and there is every likelihood of leather getting damaged while putting it through the small gap. Very often, the ball is hammered by means of wooden hammer making the leather soft. After turning the inside out the last stitches are to be completed, are paired together and brought out through the mouth slit. The paired pieces are now stitched, holding them completely outside the mouth slit. This operation requires a good amount of skill.

The mouth of the football over the edges of the slit has to be reinforced to give additional strength against the tendency to tear at this point. An ordinarily skilled worker is capable of stitching 3 to 5 standard size footballs a day. When the

football is complete, they are finished to a bright surface by applying wax pol or spraying lacquer. Then it is rounded in a rounding machine to keep in proper shape and also the bladder is tested by blowing to 200 lbs. pressure and then the balls are stamped by means of screen printing with the size, quality and the manufacturers' name. Almost all the balls are tested before despatch for manufacturing defects. Some broader pieces of leather are obtained as by-product. This can be well utilised for making No. 2 or 3 play balls.

(ii) Quality Specifications

S. No.	Characteristics	Football	Volleyball
1	2	3	4
1. Size (Circumference) in cms.		68 to 71	65 to 68
2. Weight (complete with bladder) in grms.		397 to 454	270 to 310
3. Air pressure kg/cm		0.77 to 84	0.48 to 0.52
4. No. plies intended for stitching		5	4

Net ball	Throw ball	Basket ball	Water polo ball
5	6	7	8
68 to 71	68 to 73	75 to 78	68 to 71
397 to 454	397 to 454	600 to 650	400 to 450
0.77 to 0.84	0.77 to 84	0.84 to 0.90	0.77 to 0.84
5	5	6	5

ISI Standard—IS : 417—1974 Part I to VI

Football, Volleyball, Net Ball, Throw Ball, Basket Ball and Water Polo Ball.

(iii) Production Capacity per Annum

(a) Quantity—48,000 Nos. Footballs & Volley balls 2400 Nos. Play balls (By product)

(b) Value Rs. 13,97,000/-

1. Financial Aspects : Fixed Capital

(i) Land & Building:

	Rs.
1. Land 500 sq. mtrs @ Rs 20/- per sq. Mt. (Developed area)	10,000.00
2. Building covered area 200 Sq. Mtrs. @ Rs. 300/- Sq. mtr	60,000.00
3. Other Construction such as well, drainage, etc.	5,000.00
	75,000.00

(ii) Machinery & Equipments:

	Rs.
1. Machinery & equipment as per list given below	57,000.00
2. Office equipment	5,000.00

	Rs.
3. Transportation installation & electrification of the building and machinery & other contingencies expenditure	13,000.00
Total	75,000.00
Total Fixed Capital (i plus ii)	1,50,000.00

List of machinery & Equipment (all indigenous) complete with motors).

(a) Machinery:

	Rs.
1. Wooden Drum 6' B 4' with motors H.P. 7.5 2 Nos.	12,000.00
2. Shaving machine 12" Working Width (5.0 H.P.) 1 No.	10,000.00
3. Buffing machine 12" 3(H.P.) 1 No.	7,000.00
4. Air compressor 200 lbs. pressure with 1 H.P. Motor 1 No.	2,000.00
4. Football Rounding Machine (1 H.P.) 1 No.	4,000.00
6. Water pump with motor 1 H.P. 1 No.	2,000.00
7. 3-5 Ton capacity clicking press with 2 H.P. motor 1 No.	4,000.00

Total H.P. 28

(b) Equipment:

	Rs.
1. Setting Tables	
2. Rampee	
3. Awls	
4. Wooden Clamps	
5. Needles	
6. Wooden Hammer	
7. Stone Slabs & other Tools	
8. Thickness measuring gauge	
(i) Stretching frames having 16 clamps in each frame 20 Nos.	12,000.00
Total	57,000.00

2. Working Capital (for one month)

(i) Raw Material (Per month):

A. Requirement of leather, chemicals for 100 Nos. of football and volley balls etc.

	Rs.
1. E.I. Tanned Kips app. 11 to 14 Nos. of Vth and VIth grade weighting 4 to 5 kg. each having app. weight 55 kg. @ Rs. 19/- per kg. Less sale of app. 8 kg. of recoverable cutting @ Rs. 10/- per kg. (—)	1,045.00 80.00 965.00
2. Pigment 2.50 kg. @ Rs. 18/- per kg.	45.00
3. Binder 3.25 kg. @ 21/- per kg.	68.25
4. Soda-ash 1 kg. @ Rs. 2 per kg.	2.00
5. Chrome powder 4 kg. @ Rs. 7/- per kg.	28.00
6. T.R.O. 7 kg. @ Rs. 3.75 per kg.	26.25
7. Ground nut oil 1 kg. @ Rs. 9 per kg.	9.00
8. Tallow 2 kg. @ Rs. 7/- per kg.	14.00
9. Muster or rape-seed oil 2 kg. @ Rs. 9 per kg.	18.00
10. Rawl 200 grms.	3.00
11. Resin 100 grms	0.50

	Rs.
12. Rubber solution 500 gms. @ Rs. 7/- per kg.	3.50
13. Dye app. 50 grms	6.00
14. French chalk 100	0.25
15. Thread V/594 3½ reels @ Rs. 34/- per reel	119.00
16. Lacquer 1 litre (good quality)	21.00
17. Thinner 250 grms (good quality)	3.50
18. Wax pow and beeswax	3.00
19. Latex bladder No. 5: 100 nos. @ Rs. 2.90 each	290.00
20. Latex bladder No. 3 : 5 nos. @ Rs. 2.00 each	10.00
21. Cloth for pasting (for 2nd and 3rd quality) 19 meters @ Rs. 5.50 per mts	104.50
22. Corrugated box (new) one Valued	25.00
23. Plythene bag 750 grms.	10.00
24. Hassien cloth 4 mtrs.	6.00
25. Tarred paper 3½ Mtrs.	3.00
26. Sutla 100 grms.	0.50
27. Polythene sheets 300 grms	4.25
28. Nylon strap 10 mtrs.	1.50
	1,790.00
Total raw material 4,000 balls (1790 × 40) for one month	71,600.00

(ii) Staff and Labour : (per month)

(a) Wages for 25 Nos. of skilled workers for sewing of balls on piece rate:	
1. Piece rate for sewing of Ist and 2nd quality pre-punched balls @ Rs. 5 each for 2800 balls	14,000.00
2. Piece rate for sewing of IIIrd quality pre-punched balls @ Rs. 4 each for 1200 balls	4,800.00
3. @ Rs. 3 each for 1 to 3 nos. for 200 pieces of balls (by product)	600.00
	19,400.00

(b) Direct labour: (per month regular)

1. Machine operators for shaving and buffing & clicking of panels 2 @ Rs. 300 pm.	600.00
2. Skilled worker for finishing 3 @ Rs. 250 each	750.00
3. Unskilled workers for packing, semi-chroming rounding and making and other petty works etc. 4 @ Rs. 200/- each	800.00
4. Mistry for selecting, pairing, of Pennels etc. 1 @ Rs. 400/-	400.00
5. Other contingencies labour expenditure	150.00
Total	2,700.00

Total (Rs.)

	No.	Salars	
1. Manager	Self	500/-	500.00
2. Salesman	1	500/-	500.00
3. Clerk-cum-Cashier	1	400/-	400.00
4. Store keeper-cum-clerk	1	400/-	400.00
5. Peon	1	200/-	200.00

		Rs.
6. Chowkidar	2 200/-	400.00
7. Sweeper (part-time)	1 50/-	50.00
8. Part time typist & Acct.	1 200/-	200.00
		2,150.00
Other contingencies labour expenditure		150.00
Total		2,300.00

(iii) Contingencies & other utilities Expenditure (per month):

(a) Fixed Contingencies:

1. Postage & Stationery	400.00
2. Taxes, Insurance, etc.	400.00
	800.00

(b) Variable contingencies:

1. Travelling, advertisement & Publicity.	750.00
2. Transportation etc.	750.00
3. Electrical, fuel & water	1,000.00
4. Maintenance, repairs	300.00
5. Other misc. charges	400.00
	3,200.00
Total (a plus b)	4,000.00

VI. Summary of recurring expenditure (per month):

1. Raw material & packaging charges	71,600.00
2. Director labour for regular workers	2,700.00
3. Director labour for piece rate workers	19,400.00
4. Indirect staff expenditure	2,300.00
5. Contingencies expenditure	4,000.00
	1,00,000.00
Recurring expenditure for three months	3,00,000.00

3. Total Capital Investment:

(a) Fixed Capital	1,50,000.00
(b) Working capital expenditure for 3 months	3,00,000.00
Total	4,50,000.00

4. Cost of Production (per annum):

(a) Total recurring cost	12,00,000.00
(b) Depreciation on Building @ 5%	3,250.00
(c) Dep. on machinery & equipment @ 10%	7,000.00
(d) Dep. on office equipment @ 20%	1,000.00
(e) Interest on total investment @ 15%	67,500.00
Total	12,78,750.00
Say	12,79,000.00

5. Turnover per Annum: (on whole sale ex-factory rates)

(a) Sale of Ist quality 24,000 footballs @ Rs. 35 each	8,40,000.00
(b) Sale of 2nd quality footballs, volley balls and handballs etc. @ Rs. 26 each for 9,600 balls.	2,49,600.00
(c) Sale of 3rd quality footballs, volley balls etc. @ Rs. 20 each for 14,400	2,88,000.00
(d) Sale of 2400 pieces by-product, children play balls @ Rs. 8 each	19,200.00
Total	13,96,800.00
Say	13,97,000.00

6. Profit & Loss Accounts (per annum)

Sales per annum	Rs. 13,97,000.00
Product cost per annum	12,79,000.00
Profit per annum before taxes	1,18,000.00

7. Rate of return on total Investment	26.2%
8. Break even point	55.6%

9. Suppliers of Machinery & Equipments

Name & Addresses	Items
1. M/s. Shalimar Engg. Works Pvt. Ltd., 12-B, Preburam Sarear Lane, Calcutta-15.	Buffing and Shaving Machines & wooden drums.
2. M/s. New Bengal Machinery Co., No. 9, Tanga Road, Calcutta-43.	Do.
3. M/s. Rajam Bros, 1/47-B, Thirupallist, Perimaet, Madras-5.	Do.
4. M/s. India Tanning Madhinery Corp., 36/37, Angappa Nicken Street, Madras-1.	Do.
6. M/s. Ellay Engg., 7. Thulsi Street, Prithvipakkam, Ambatur, Madras-53.	Do.
7. M/s. Vedaguru Engg. Works, 15, M.G. Rd., Ambur (Tamil Nadu).	Do.
8. M/s. Vak Engg. Pvt. Ltd., Queens Court, 15 Montath Road, Madras-5.	Do.
9. M/s. Indo German Shoe Machine Co. Pvt. Ltd., 107, Kandivli Indl. Estate, Kandivli (West) Bombay-67.	Hydraulic clicking Press
10 M/s. Mistry Avtar Singh Engg. Works, Basti Sheikh Road, Jullundur-2.	Dies and Clicking Press.
11. M/s. Goodluck Engg. Works, Dhan Mohalla, Basti Road, Opp. Raja Hospital, Jullundur City-1.	Do.
12. M/s. New Kalsi Engg. Works, Gill Road, Ludhiana-3.	Clicking Press
13. Ms. Enkey (India) Rubber Co. Pvt. Ltd. 2/8, Roop Nagar, New Delhi-7.	Seam less latex bladders
14. M/s. Helix Latex Industries, B-28, G. T. Road, Indl. Area, Delhi-7.	Do.

10. Suppliers of Raw Materials

1. M/s. Medium Distributors, Patel Chowk, Jullundur City-1.	Acid & chrome Powder and TRO
2. M/s. Ganesh Laboratories, M-13, Indl. Area, Jullundur-4.	Do.
3. M/s. J & P Coats Pvt. Ltd., Sadanand Rd., Ajmeri Gate, New Delhi.	Thread
4. M/s. Modi Spinning Mill, Modinagar (U.P.)	Do.
5. M/s. K.C. Verma, Basti Nau, Jullundur City-2.	Thread, Raul, Rosin material etc.
6. M/s. Rata Engg. Bhargo Nagar, Jullundur-3.	Wooden Drum Stretching frames.
7. M/s. Western Corporation, Indl. Area, Jullundur-4.	Stretching Frames.
8. M/s. Inspection Instrument Co. 93, Narayan Dhuru St., Bombay-3	Thickness Measuring guage
9. M/s. BASF India Ltd., May baker House, Sudan Kalu Ahire Marg, Bombay-25.	Pigments binders etc.
10. M/s. Colour Chem. Ltd., 194, Church Gate Reclamation, Bombay-20.	Do.
11. M/s. Rajindra Agencies, Opp. Dist. Jail, G.T. Road, Jullundur City.	Dyes and other chemicals etc.
12. M/s. Sandoz (India) Ltd., Dr. Annie Besant Rd., Worli, Bombay-18.	Do.
13. M/s. Bangalore Acrylics, 28, Madharage, Bangalore-1.	Dyes and other chemical etc.
14. M/s. Leather Chemicals & Industries Ltd., 1, New Alipur Block Calcutta-53.	Pigments & Binder
15. M/s. Thaker Dess & Co., G.T. Rd., Jullundur City-1.	Binder
16. M/s. Indo Fil Chemicals Ltd., Nirlon House, Dr. Annie Besant Road, Bombay-25.	Binder, Lacquors, Dyes, etc.
17. M/s. Rangwala, Basti Nau, Jullundur City-2.	Do.

(Reserved item Sl. No. 767)

A. Introduction

Hockey is among the one of the major games of the world today and has been becoming popular all over the world. As per the registration procedure of the players in foreign countries there are one lakh players each in Holland and West Germany and 40000 in Newzeland. Similarly other East European & South American countries have also started popularising this game. In India, now more stress is being paid for the encouragement of this game. Thus demand for hockey sticks is increasing day by day all over the World and also in the home market. In foreign countries players are generally purchasing at least one hockey stick. once in two years thus the export of hockey sticks are increasing day by day. At present about Rs. 75 lakhs worth of hockey sticks are being exported and expected to cross Rs. one crore at the end of 6th Five Years Plan due to popularisation of this game both at home and in foreign countries.

Hockey sticks are mainly manufactured in Punjab State of India and Pakistan due to availability of mulbury wood grown on the bank of canals, road sides and other areas. This type of mulbury wood is also available in considerable quantity in parts of U.P., Haryana, Rajasthan and Himachal Pradesh. The quality of wood available in Punjab is of high quality having flexibility and parallel grain structure which resists the jerk while hitting the ball and would not crack. Cane is available from Andaman and Nicobar Islands, Karnataka, Kerala, Goa, etc. The industry can be started by getting mulbury blades of good quality. Mulbury grown for breeding silk worm is not suitable for manufacturing hockey sticks.

B. Technical Aspects*(i) Process of manufacture*

Mulbury wood karies are boiled in hot water four to six hours, tied in 'Shakanjas' and moulded in press. Moulded Karies are dried completely, removed from Shakanjas and sawed into blades. selection of grade is done after examining the grain lines and knots etc. of sawed blades. The cane handles are manufactured separately. Both are finished and glued together in Shakanjas and also tied with rope. On drying

there are finished by hand with file and emery paper. Cloth, tape and twine is wrapped after application of synthetic glue. Then they are either finished by applying duco paint or joint is bonded with parchment. Towel or leather grip is fixed on handles. Blade is finished by applying clear lacquer polish.

(ii) Quality Specifications : Indian Standard No. IS : 829-1965

(iii) Production Capacity (Per annum)	Quantity
Hockey sticks	18000 Hockey sticks (6000 pieces each of 1st, 2nd, 3rd or youth quality per annum)
Value	Rs. 3,72,000

C. Financial Aspects*(I) Fixed Capital*

	Rs.
(a) Land = 400 sq. metre @ Rs. 20/- per sq. metre	8,000.00
(b) Building	
(a) Covered area 200 sq. metre @ Rs. 200/- per metre	40,000.00
(b) Other constructions	2,000.00
Total	42,000.00

(c) Machinery and Tools

	Rs.
(1) Sawing Machine 36" with 10 HP Motor	5,000.00
(2) Bending press with 10 HP motor	5,000.00
(3) Tools and equipments	5,000.00
(4) Office equipment	5,000.00
(5) Electrification installation transportation, etc.	5,000.00
Total	25,000.00

Total fixed capital (a + b + c) = 75,000/-

Total H. P. required = 20 H.P.

2. Working Capital (Per Month)*(i) Staff and Labour (Per month)**(a) Indirect staff*

	Rs.
1. Manager 1	600.00
2. Clerk cum typist 1	400.00
3. Chowkidar	200.00
4. Sweeper (Part time)	50.00
5. Part Time Accountant	100.00
6. Approximate perquisites expenditure	150.00
	1,500.00

(b) Director Labour

	Rs.
1. Mistry	500.00
2. Skilled worker 4 @ Rs. 400 each	1,600.00
3. Semi skilled 2 @ Rs. 300 each	600.00
4. Unskilled 2 @ Rs. 200 each	400.00
5. Approximate perquisites expenditure	400.00
Total	3,500.00

(ii) Raw Material requirement (Per month) including Packaging materials

Estimate for 100 Hockey Sticks

S. No.	Name of the Raw material	Quantity	Quality (in Rs.)			
			1st	2nd	3rd or Youth	
1	2	3	4	5	6	
1. Mulburry blades	100		650.00	450	250	
2. Cane handles	40 to 50 pcs.		175	150	125	
3. Ply pieces	150 to 200 pcs.		16	13	10	
4. Synthetic glue (movicol or fevicol)	3 kg. to 4 kg.		88	77	66	
5. Clue flakes	1 to 1½ kg.		13	11	9	
6. Pachra	100 pcs.		4	4	3	
7. Towel grips	90 to 100 Mts.		80	80	70	
8. Coloured cotton tape	3 to 4 bundles		35	30	25	
9. Tape 1" (white) (Cotton markeen)	Do.		45	40	35	
10. Binding cloth (Cotton markeen)	5 to 6 metre		20	15	10	
11. Duco paint	3 to 4 litres		53	48	—	
12. Parchment	1000 pcs.		—	—	75	
13. Thinner	1 to 3 litre		10	8	—	
14. Polish clear	Do.		60	50	46	
15. Cello tape	50 to 100 Mts.		19	17	10	
16. Transfer & others	200 to 400 pcs.		100	90	50	
17. Polythene bags & Poly sheets	—		16	13	10	
18. Corrugated or wooden box	2 or one		40	40	30	
19. Brown and tarred paper	—		15	14	7	
20. Hassien cloth & Sutli etc.	—		11	10	9	
Total			1450	1160	840	

Expenditure for five hundred Sticks of 1st, 2nd, and 3rd quality each 7250 5800 4200
Total : Rs. 17,250/-

(iii) Contingencies

(a) Fixed contingencies

1. Postage, stationery, telephone	300.00
2. Taxes etc.	200.00
	500.00

(b) Variable Contingencies

	Rs.
1. Electricity, fuel water	700.00
2. Travelling expense	400.00
3. Publicity advertisement etc.	250.00
4. Transportation and other Misc. expenses .	600.00
5. Maintenance, repairs, etc.	300.00
Total	2,250.00

Total a+b = Rs. 2750/-

Total Working Capital (Per month)

(i) Indirect staff and labour	1,500.00
(ii) Direct staff and labour	3,500.00
(iii) Raw material	17,250.00
(iv) Contingencies	2,750.00
	25,000.00

Working Capital for Three months Rs, 75,000/-

(3) Total investment :

(a) Fixed capital	75,000.00
(b) Working capital for 3 months	75,000.00
	1,50,000.00

(4) Total Cost of Production (Per annum)

Production cost	3,00,000.00
Depreciation on bldg. @ 5 %	2,100.00
Depreciation on machinery etc. @ 10%	2,000.00
Interest on total investment @ 15%	22,500.00
Depreciation on office equipments @ 20%	1,000.00
Total	3,27,600.00

(5) Turnover per annum (on wholesale rate including forwarding etc.)

1. Sale of 6000 pcs. of 1st quality hockey sticks @ Rs. 26/- each	1,56,000.00
2. Sale of 6000 pcs. of 2nd quality hockey sticks @ Rs. 20 each	1,20,000.00
3. Sale of 6000 pcs. of 3rd or youth quality hockey sticks @ Rs. 16/- each	96,000.00
	3,72,000.00

(6) Profit and loss Account (Per annum)

1. Total annual sales	3,72,000.00
2. Annual production cost	3,27,600.00
Profit per annum before taxes	
	2,44,400.00

(7) Rate of return on total investment 29.6%

(8) Break even Point 53%

(9) Address of suppliers of machinery and Equipment

1. M/s. Avtar Engineering Works, Basti Road, Jullundur (for press and tools)
2. M/s. Aggarwal Engineering Works (Regd.), G. T. Road Batala (Punjab) (Sawing Machine and Tools)
3. M/s. Golden Engineering Works, Basti Adda, Jullundur.

(Reserved item Sl. No. 763)

A. Introduction

Leather purses and hand bags are amongst the fashion items for which demand is multiplying day by day both in the developed and developing countries. These are items of utilities but have not taken place as part of the dress for either sex. Attractive designs and good selection of material used for the end product make one feel crazy about the bags, thus making the scope of its manufacture widened both within the country and abroad. A most favourable point which goes in favour of this industry to be set up is the indigenous availability of raw material and skilled labour. It is a labour oriented industry and can be set up in any part of the country including the village sector.

B. Technical Aspect

I. Process Outline : Patterns are cut according to the samples for cutting various leather components. Cut leather components are then skived, punched, beaded and then closed. A suitable lining is stitched and attached with the leather bag or the purse to fit in properly. Where zips and other fittings are to be used, the same is done during process as and when desired.

II. Quality Specifications : ISI Specifications

- (a) Chrome Upper Leather 478—1971
(b) Lining Leather 3840—1966

III. Production Capacity (Per annum)

Sl. No.	Item	Qty.	Value (in Rs.)
1.	Hand Bags	7,500 pcs.	2,62,500.00
2.	Purses	7,500 pcs.	1,05,000.00
Total :			3,67,500.00

C. Financial Aspect

(i) Land and Building

- (a) Land 150 sq. mts. } Rented
(b) Building 100 sq. mts. }

(ii) Machinery and Equipments

S. No.	Description	Indigenous/ Imported	H.P.	Qty.	Value Rs.
1.	Industrial Sewing M/c	Indig.	Nil	5	8,000.00
2.	Clicking Press Hand operated	Do.	—	1	1,000.00
3.	Stamping M/c	Do.	0.33	1	300.00
4.	Skiving M/c	Do.	0.33	1	11,000.00
					20,300.00
(b) Cost of tools and equipments					2,000.00
(c) Cost of office furniture & working tables etc.					5,000.00
Total cost of M/cs, tools, equipments & Office furniture etc.					27,300.00

Total fixed Capital = (i) + (ii) above = 27,300

2. Working Capital (Per Month)

(i) Personnel : Administrative and Supervisory (Per Month)

S. No.	Designation	No.	Salary Rs.	Total Rs.
1.	Manager	1	1,000.00	1,000.00
2.	Supervisor	1	500.00	500.00
3.	Accountant-cum-Clerk	1	500.00	500.00
4.	Store-keeper	1	400.00	400.00
5.	Peon-cum-Chowkidar	1	250.00	250.00
Technical				
6.	Skilled labour	8	300.00	2,400.00
				5,050.00
Perquisites @ 20% of the salary				1,010.00
Total				6,060.00

(ii) Raw Material (Per Month) :

S. No.	Particulars	Indigenous	Qty.	Rate Rs.	Price Rs.
1.	Lining leather	Do.	940 sq.ft.	3/-	2,820.00
2.	Chrome leather	Do.	2500 sq. ft.	4/-	10,000.00
3.	Zip and other fittings	Do.	1250 pcs.	2/-	2,500.00
Total					15,320.00

(iii) Utilities (Per Month)	
Power 100 KWH units @ Rs. 25 N.P. per unit = Rs. 25	
(iv) Other Contingent expenses (P. M.)	
Rent	1,000.00
Postage & Stationery	150.00
Telephone	125.00
Consumable stores	50.00
Repairs and replacements	150.00
Transport charges	125.00
Advertisement	100.00
	<u>1,700.00</u>

Total working capital for three months i.e.	
(i)+(ii)+(iii)+(iv) × 3	= 69,315.00
Say	= 69,400.00

3. Total Capital Investment	
Fixed capital	27,300.00
Working capital for 3 months	69,400.00
	<u>96,700.00</u>

4. Cost of Production (Per Year)	
(a) Total recurring cost per year	2,77,260.00
(b) Depreciation on machineries @ 10%	2,030.00
(c) Depreciation on tools & equipments @ 25%	500.00
(d) Depreciation on office equipments @ 20%	1,000.00
(e) Interest on total investment @ 15%	14,500.00
Total :	<u>2,95,290.00</u>

5. Turnover (Per Year)			
Item	Qty.	Rate	Value
			Rs.
Gents Purses	7500 Pcs.	12/- P.pc.	90,000.00
Shoulder Bags	7500 pcs.	35/- P.pc.	2,62,500.00
			<u>3,52,500.00</u>

6. Profit before taxation	60210
7. Rate of return on Total investment	62%
8. Break-even point	65%

9. Suppliers of raw Materials	
1. Chrome Leather Co., Chrome-pet Madras-44	Chrome/calf & lining leathers
2. Gordon Woodroffe Leather Mfg. Co., Pallavaram, Madras-43.	Do.
3. T. Abdul Wahid & Co., 19, Vepery High Road, Madras-3.	Do.
4. South East Tanning Co., 1C, Naval Hospital Road, Periamet, Madras-3.	Do.
5. Rashi Leathers Pvt. Ltd., 11A Sydenhams Road, Periamet, Madras-3.	Do.
6. Modi Thread, Modinagar, U.P.	Thread
7. Dunlop India Ltd.; 4/3, Asaf Ali Road, New Delhi-2.	Adhesive
10. Suppliers of Shoe Machinery	
1. S. P. Engg. Works, Dayal Bagh Road, New Agra.	Shoe M/cs.
2. Benson Industries, 96, Sri Arbindo Road, Salkia, Howrah.	Do.
3. Bata India (P) Ltd., Batanagar. 24 Parganas, West Bengal.	Do.
4. A. C. Mitter & Co. Mitter House, 71, Ganesh Chandra Avenue, Calcutta-13.	Do.
5. Perfect Machine Tools & Co., 6, Sir Phiroz Shah Mehta Road, Bombay-1.	Do.
6. Francis Klein & Co., Ganesh Chandra Avenue, Calcutta-13.	Do.
7. National Engg. Works, New Nagpada Road, Opp. Hospital, Bombay-8.	Accessories. Moulds, etc.
8. Singer Sewing M/c Co. Ltd., Mount Road, Madras-2.	Sewing Machine
9. Indl. Sewing Machine (P) Ltd., 1/23B, Asaf Ali Road, New Delhi-2.	Do.
10. Indo German Shoe M/c Co. Pvt. Ltd., 107, Kandivli Indl. Estate, Kandivli (West) Bombay-67	Machines & Moulds
11. Redstar Engineers, D-55, N.D.S.E. Part I, New Delhi-49.	Shoe Machines & Moulds.
(Reserved item Sl. No. 96)	

A. Introduction

Badminton game is being played all over the World by men, women and children alike. With the rise in standard of living of the people in the country and incentives given by the Government and Semi-Government bodies to popularise the sports, the demand of sports goods is increasing rapidly in our country. Thus the demand for the shuttle cock is increasing alongwith the Badminton Rackets in India.

From the manufacturing point of view this is the simplest item and can be manufactured by ladies and children at home. There are at present two hundred units in India, majority of them in Ullundur, Meerut and some at Delhi, Calcutta and other cities. Mostly the goods are consumed in India and negligible quantity is exported due to high cost of production in India as compared to South East Asian countries. Due to increase in popularity of game there is a scope for a few units in every State where there are no units. Goose, feathers and cork are imported items whereas Duck and Hen feathers are locally available.

B. Technical Aspects**(I) Process Out Line**

Four types of feathers are used for manufacturing four quality of shuttle cocks viz. Duck and 'Goose broad' for first quality, goose bonda feathers for 2nd, first class hen feather for 3rd quality and inferior quality hen feathers for 4th quality. The quality of cork bottom leather caps, thread, synthetic glue is also selected as per the quality of shuttle cocks to be manufactured. Duck feathers are available from West Bengal, Jammu & Kashmir, Goose feathers and goose bonda feathers are imported from Hong Kong, U. K. etc. Hen feathers are available from local poultry farms. As mentioned above, feathers imported or indigenous are thoroughly washed with soft soap or detergent powder before it is ready for use in the manufacture of shuttle cocks. The feathers after washing are bleached with licofur WSI (Sandoz) or little quantity of ultramarine blue. Sometimes a small quantity of glue is also applied to the feather to increase its luster. After washing and drying all defective feathers are removed as only the perfect ones are useful for the manufacture of shuttle cocks.

Feather is thereafter cut to the shape of shuttle on a small hand press. Edges of the shuttles are again cut neatly with a pair of scissors. Only neatly cut and uniformly shaped shuttles can make a quality shuttle cock.

Well shaped corks, made of cork wood according to quality imported from Portugal or Spain are used in the manufacture of Shuttle cocks. Usually 16 holes are made in each cork by a small hand driven drill. Drills, jigs and presses are all available indigenously. Skilled workers then fix the shuttle into the hole of the cork with glue. This is also a skilled operation. Now the shuttle takes the shape of a shuttle cock. Mercerised cotton or silk thread is then used to tighten up the shuttle already fixed with the cork in order to add strength and to give proper shape to the shuttle cocks. White sheep skin caps of good quality leather are then fixed on the cork with glue. Colourless edible gelatine or synthetic glue viz. movicol or favicol is also to be applied to the shuttle cock with a small brush with a view to increase toughness of the product. A silk ribbon is then fixed round the cork with glue to lend beauty as well as strength to the shuttle cock. Finally the shuttle cocks are measured on a weighing scale and their weight is adjusted by fixing stell pins on the cork. Each shuttle cock must have a standard weight varying from 77 to 85 grains for out door games and 68 to 75 grains for indoor games. At the end finished shuttle cocks are packed in card board boxes fitted with Tin or cardboard lids on both ends with a dozen of shuttle cocks.

(ii) Quality Specification

1. S. I. Specification No. IS - 415—1963.

(iii) Production capacity (Per annum)

- (a) Quantity—19200 dozen
(b) Value —Rs. 3,45,600/-

C. Financial Aspects**I. Land and Building**

10 sq. metres with 60 sq. metres covered area: Rented,

II. Machinery and Equipments (Indigenous)

	Rs.
Hand Press for Cutting feather into shuttle	1,000.00
Jigs for boring	300.00
Wooden board with holes	200.00
Hand Drill for boring the cork	500.00
Tools and other equipments	2,000.00
Office equipments etc.	3,000.00
Total	7,000.00

2. Recurring Expenditure (Per Month) Staff and Labour

(a) Indirect Staff

Manager—Self	1	300.00
Clerk-cum-cashier	1	100.00
Part-time Accountant	1	100.00
Part Time Sweeper & Chowkidar	1	350.00
SalesMan		175.00
Peon-cum-Messenger etc.		
Total		1,025.00
Other perquisites of salaries		275.00
Total		1,300.00

(d) Details of Raw Material and Packing (Per Month)

Name of Raw material	Nos.	Quantity & Rate per dozen for 4 qualities			
		1st	2nd	3rd	4th
1	2	3	4	5	6
1. Cork Bottom 1" × 1"	12	2.65	2.65	1.50	1.00
2. Feather					
(a) Duck or goose broad	192	7.00	—	—	—
(b) Goose Bonda (Tail).	192	—	4.50	—	—
(c) Hen 1st quality	192	—	—	2.25	—
(d) Hen 2nd quality	192	—	—	—	1.00
3. Leather Bottom Cap	12	2.00	1.50	1.15	0.70
4. (a) Synthetic glue	}	3.0	2.50	2.00	1.50
(b) Glue (animal)					
(c) Ribbon (silk or cloth)					
(d) Thread					
(e) Cloth					
(f) Plastic ribbon					
(g) Soft soap					
(h) Licofur					
5. Card Board Box for packing	1	1.20	1.00	1.00	1.00
6. Miscellaneous	—	0.15	0.10	0.10	0.05
Total :	—	16.00	12.25	8.00	5.25
Expenditure for 400 dozen each		6400	4900	3200	2100
Total of I+II+III+IV = Rs.		16,600			

(c) Direct Labour (Per month)

	I	II	III	IV
Piece rate per dozen (About 10 to 15 workers)	3.00	3.00	2.50	2.25
Direct labour for 400 Dozen of each	1200	1200	1000	900
Total Rs. 4300				

(d) Other contingent Expenses (Per month) Including Utilities

(i) Fixed Contingencies (Per month)

	Rs.
Rent	500.00
Postage, stationery, telephone etc.	600.00
Taxes	100.00
Total	1,200.00

(ii) Variable Contingencies (Per Month)

	Rs.
Electricity	150.00
Fuel	100.00
Water	50.00
Maintenance and repairs of bldg.	100.00

Transportation of raw material and other mics.	600.00
expenditure	100.00
Advertisement & publicity	500.00
Travelling etc.	
Total	1,600.00

Total Working Capital required (Per Month)

	Rs.
Direct labour	4,300.00
Indirect staff	1,300.00
Raw material	16,600.00
Contingencies fixed	1,200.00
Contingencies variable	1,600.00
Total	25,000.00

Total working Capital for one month

Total working capital for three months	75,000.00
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3. Total Investment

	Rs.
Fixed capital	7,000.00
Working capital for 3 months	75,000.00
Total	82,000.00

4. Cost of Production per annum

	Rs.
1. Total production cost	3,00,000.00
2. Depreciation on machinery @ 10% P.A.	500.00
3. Depreciation on office equipment @ 20%	400.00
4. Interest on total investment @ 15% P.A.	12,300.00
Total	3,13,200.00

5. Turnover (Per Annum)

(Wholesale including forwarding and transportation charges)

(1) Sale of duck feather or goose broad shuttle cock @ Rs. 26/- per doz. for 4800 dozen	1,24,800.00
(2) Sale of goose bonda feathers shuttle cock @ Rs. 21/- per doz. for 4800 dozen	1,00,800.00
(3) Sale of hen feather shuttle cock of good quality @ Rs. 16/- per doz. for 4800 doz.	76,800.00
(4) Sale of Hen feather shuttle cock of cheap quality @ Rs. 9/- per dozen for 4800 dozen	43,200.00
Total	3,45,600.00

6. Profit and Loss Account Per Annum

	Rs.
Total Annual Sales	3,45,600.00
Total Annual production cost	3,13,200.00
Profit before Taxation	32,400.00

(7) Rate of return on total investment	39.5
(8) Break Even Point	56.8

(9) List of Machinery and Raw Material Suppliers

1. M/s. K. C. Verma, Basti Nau, Jullundur-2.
2. M/s. Haveli Ram Verma, Basti Nau, Jullundur-2.
3. M/s. Anand Shuttle Cock, Basti Nau, Jullundur-2.
4. M/s. Avtar Engg. Works, Basti Sheikh Road, Jullundur-2.
5. M/s. Golden Engg. Works, Adda Bastian, Jullundur City-1

(Reserved item Sl. No. 762)

WRIST WATCH STRAPS (LEATHER)

A. Introduction

The watch strap industry has always been progressing with the increase in the demand for watches during the last one decade. There are number of watch manufacturers in India whose demand for straps are being met by a few units in small scale sector. The market for the straps is steadily increasing with the increase in production of watches. Leather watch straps require indigenously available raw material and have reasonably good return.

B. Technical Aspect

I. Process Outlines

Leather straps are cut according to the size and design. Both leather straps and the loops are folded depending upon the type of edge treatment and the edges are then creased. The bucklets are fitted and the lining fixed by means of rubber adhesive/stitching. Lining is cut to the size of straps and the holes are punched & finished. The edges and the surface of the straps are cleaned and packed.

II. Quality specifications : ISI Specifications

(a) Chrome Upper Leather	478—1971
(b) Lining Leather	3840—1966

III. Production Capacity (per annum) :

Item	Qty.	Value (Rs.)
Leather Watch Straps	1,80,000 pcs.	3.6 lakhs.

C. Financial Aspect

1. Fixed Capital

(i) Land and Building

(a) Land	100 sq. mtfs. (Rented)
(b) Building	50 sq. mts. (Rented)

(ii) Machinery and Equipment

Sl. No.	Description	Ind./ Imp.	H.P.	Qty.	Value (Rs.)
1.	Clicking Press (Hand Operated) with dies etc.	Ind.		1	1,500.00
2.	Leather Skiving M/c.	Ind.	0.33	1	11,000.00
3.	High Speed Indl. Sewing Machine	Ind.	0.33	1	2,500.00
4.	Punching Equipments	Ind.		1	250.00
5.	Stamping Machine	Ind.		1	250.00
Total					15,500.00

(b) Cost of tools & Fixtures

1,000.00

(c) Cost of office equipments including working table

2,500.00

Total cost of machinery, tools & equipments (i.e. a plus b plus c above)

19,000.00

Total Fixed Capital (i plus ii)

19,000.00

2. Working Capital

(i) Personnel : Administrative and Supervisory (per month)

Sl. No.	Designation	No.	Salary (Rs.)	Total (Rs.)
1.	Manager	1	1,000.00	1,000.00
2.	Accountant	1	500.00	500.00
3.	Clerk-cum-Store Keeper	1	400.00	400.00
4.	Peon-cum-chowkidar	1	250.00	250.00

Technical

5.	Skilled Worker	5	300.00	1,500.00
Total (salaries)				3,650.00
Perquisites @ 20% of the salaries				730.00
Total Say				4,380.00
				4,400.00

(ii) Raw Material (per month)

Sl. No.	Particulars	Ind./ Imp.	Qty.	Rate	Value (Rs.)
1.	Leather	Ind.	2,080/- Sq. ft.	5/-	10,400.00
2.	Other grinders i.e. buckle, thread, solutions, and Packing Materials	Ind.		0.62 per pc.	9,300.00
3.	Lining Leather	Ind.	2080	3/-	6,240.00
Total Say					25,940.00
					26,000.00

(iii) Power 100 KV Unit @ 25 N P.

25.00

(iv) Other contingent expenditure (per month)

Rs.

(a) Rent	500.00
(b) Postage & Stationery	150.00
(c) Telephone	100.00
(d) Consumable Stores	50.00
(e) Repairs & Replacement	150.00
(f) Transport charges	125.00
(g) Advertisement	125.00
Total	1,200.00

Total working capital (per month)
(i.e. i plus ii plus iii & iv above) . . . 31,625.00

Working Capital for 3 months . . . 94,875.00
Say . . . 95,000.00

3. Total Capital Investment

Fixed Capital . . . 19,000.00

Working Capital (for three months) . . . 95,000.00

Total . . . 1,14,000.00

4. Cost of production (per year)

(a) Total recurring cost per year . . . 3,80,000.00

(b) Depreciation on machine & equipment @ 10% . . . 1,550.00

(c) Depreciation on tools & fixtures @ 25% . . . 250.00

(d) Depreciation on office equipment @ 20% . . . 500.00

(e) Interest on the total investment @ 15% . . . 17,100.00
(i.e. on 19,000 plus 95,000)

Total . . . 3,99,400.00

5. Turnover per year

Sl. No.	Item	Qty. (Pcs.)	Rate (Rs.)	Value (Rs.)
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(i) Watch Straps . . . 1,80,000 . . . 2.50 . . . 4,50,000.00

6. Profit before taxation per year . . . 50,600.00

7. Rate of Return on total investment . . . 44.4%

8. Break even point . . . 64%

9. Suppliers of Raw Materials

(i) M/s. Chrome Leather Co. . . Chrome/Calf & Lining leathers.
M/s. Chrome-Pet, Madras-44.

(ii) M/s. Gordon Woodroffe, Pallavaran Madras-43. . . Do.

(iii) M/s. T. Abdul Wahid & Co., 19, Vepery High Road, Madras-3. . . Do.

(iv) Zam Zam Tanners, Kundan Rd., UNNAO, (U.P.) . . . Do.

(v) Zaz Tannery, Jajmow, Kanpur-10.

Chrome/Calf & Lining leathers

(vi) Pioneer Tannery Jajmow, Kanpur-10. . . Do.

(vii) M/s. Dunlop India Ltd., 4/3, Asaf Ali Rd., New Delhi-2. . . Adhesive

(viii) M/s. Indl. Allied & Electronics Ltd., Poona. . . Do.

(ix) M/s. J. P. Coats, (P) Ltd., Opp. T.T. Arts, Crawford Market, Bombay-3. . . Threads

(x) Modi Thread, Modinagar, U.P. . . Do.

(xi) M/s. Pioneer Eyelets Mfg. Co., Cares Road, Yogeshwari (East), Bombay-60 . . . Eyelets & Buckles

10. Suppliers of Machinery and Equipments

(i) S. P. Engg. Works, Dayal Bagh Road, New Agra. . . Machines.

(ii) Benson Industries, 96, Sri Arabindo Road, Salkia, Howrah. . . Do.

(iii) Bata India Ltd. Batanagar, 24, Parganas, (W.B.). . . Do.

(iv) A.C. Mitter & Co. Mitter House, 71, Ganesh Chandra, Avenue, Calcutta-13. . . Machine

(v) Perfect Machine Tools & Co., 6, Sir Phiroz Shah Mehta Rd., Bombay-1. . . Do.

(vi) Francis Klein & Co., Ganesh Chandra Avenue, Calcutta-13. . . Do.

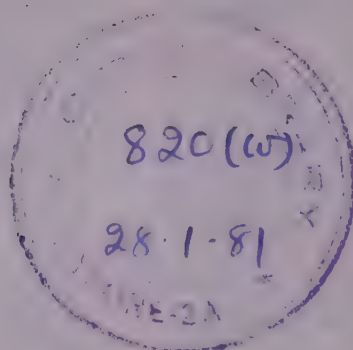
(vii) Singer Sewing m/c. Cot. Ltd., Mount Road, Madras-2. . . Sewing Machines.

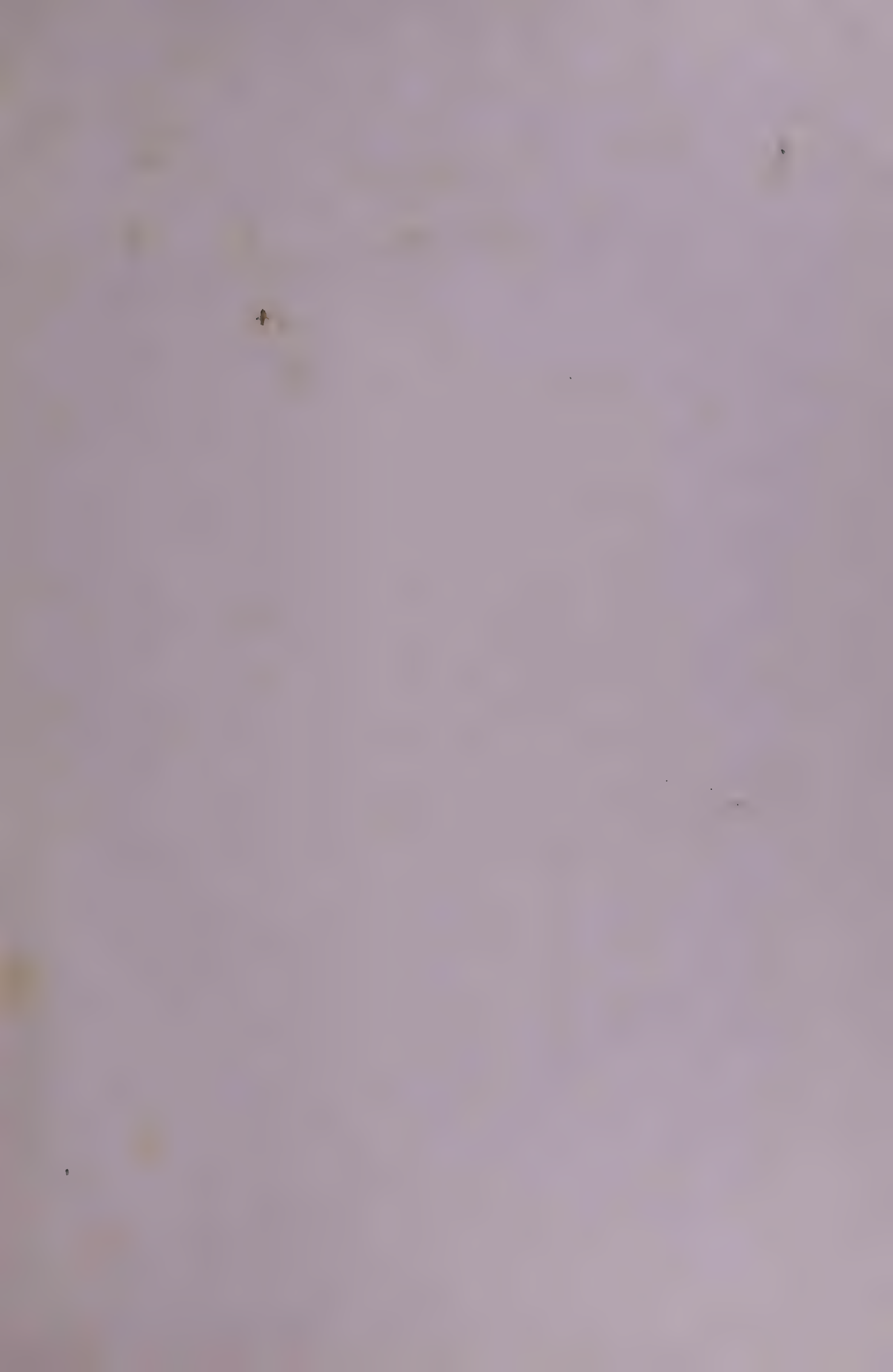
(viii) Industrial M/c. Delhi (P) Ltd., 1/23-B, Asaf Ali Road, New Delhi-1. . . Do.

(ix) Indo German Shoe M/c. Co. (P) Ltd., 107, Kandivli Indl. Estate Kandivli (West), Bombay-67. . . Machine

(x) Red Star Engineers, D-55, N.D.S.E. Pt. I, New Delhi 49. . . Do.

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